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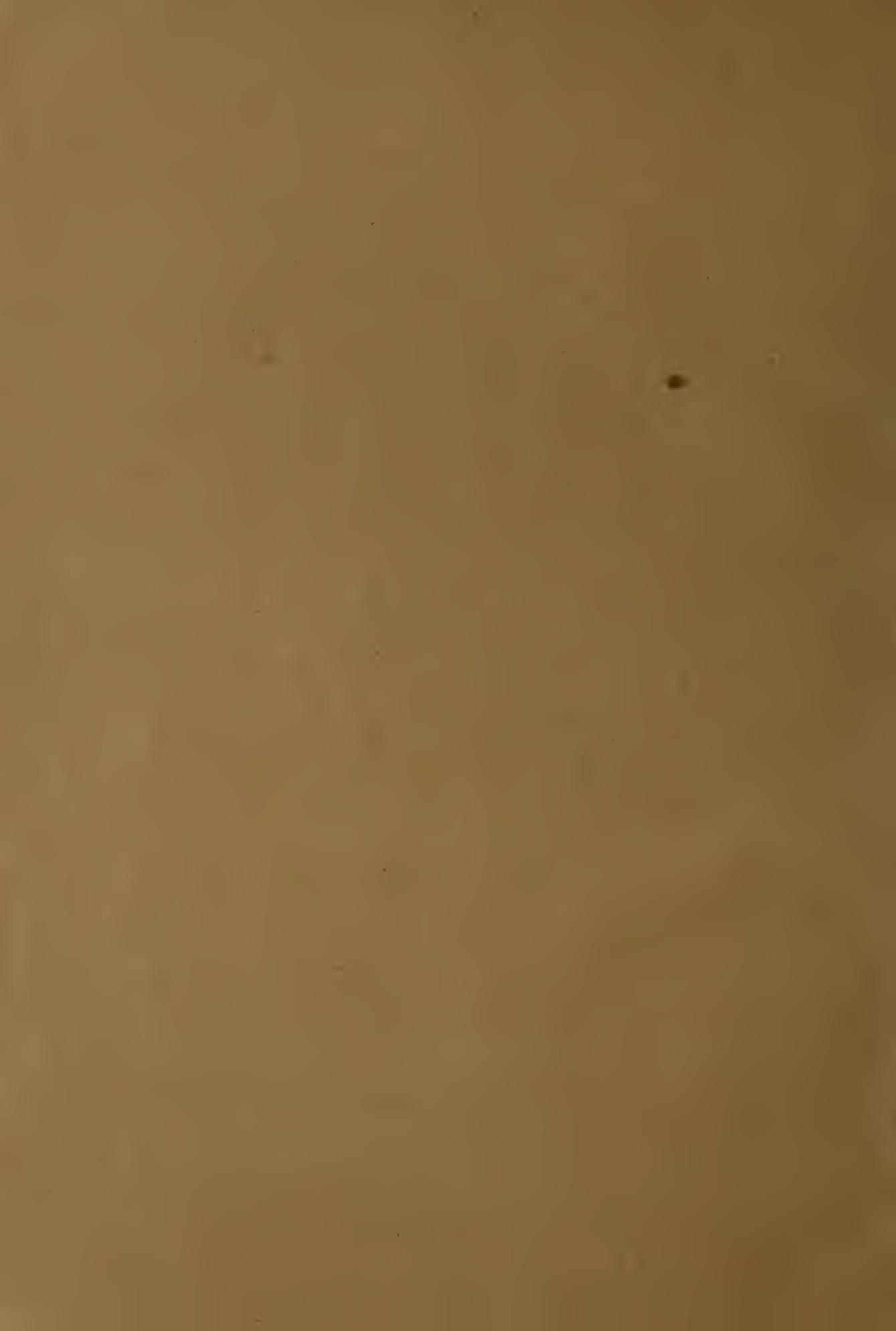


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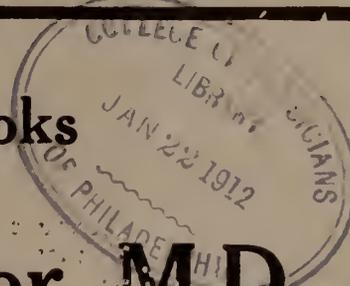


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Vol. XII.

JANUARY, 1912

No. 1

EDITORIAL DEPARTMENT

CHRISTIAN SCIENCE AND THE CANAL ZONE.

IN a Federal Court recently one Elijah Sanford was tried and convicted of causing the death of six persons, during a cruise of the schooner "Coronet" by violating the Federal laws relative to properly provisioning the ship.

Sanford is the leader of a queer religious sect called the Holy Ghost and Us Society, and recently took his deluded followers on a long cruise which he undertook for the conversion of the world. He was practicing the tenets of his peculiar form of belief when he came into conflict with the Federal laws. An unsympathetic Federal judge has just sentenced him to ten years' imprisonment in the Atlanta penitentiary.

In sharp contrast to the action of the Federal Court is the recent executive order of President Taft relating to the practice of medicine in the Canal Zone, which reads as follows:

Section 3.—Any person shall be regarded as practicing medicine within the meaning of this order who shall prescribe for, operate on, or in any wise attempt to heal, cure, or alleviate, or who shall in any wise treat any disease or any physical or mental ailment of another; provided, that nothing in this order shall be construed to prohibit the practice of the religious tenets of any church in the ministrations of the sick or suffering by mental or spiritual means without the use of any drug or material remedy, whether gratuitously or for compensation, provided that sanitary laws, orders, rules, and regulations as are now or hereafter may be in force in the Canal Zone are complied with.

This order renders the "Christian Science" practitioners immune against any regulations as to previous education, knowledge of disease, etc., to which other practitioners of the healing art are subject and permits them boldly to hang out their shingles as doctors of Christian Science, under the specious pretext that they are practicing the tenets of their religion. They are in fact permitted to practice medicine without any knowledge of the etiology and pathology of disease.

The Canal Zone is a queer place for the Chris-

tian Science practitioner to invade with the permission of the Chief Executive. Christian Science denies the existence of disease. Why screen the windows on the Isthmus? Why exterminate the mosquito? Why drain swamps? Why have any sanitary precautions whatever if there is no such thing as disease? Col. Gorgas has won one of the most notable victories in the history of science in the control of disease in the Isthmus, and now the Christian Science practitioner is going to show him "gratuitously or for compensation" how utterly foolish and futile have been his precautions and our great and powerful government proceeds to stultify itself and Col. Gorgas by excepting Christian Science practitioners from the rules, which govern the practice of medicine in the Canal Zone, because it is the practice of the tenets of a religion! If absent treatment is effective why should the Christian Science practitioners travel to the Isthmus at all. Absent treatment from New York ought to be efficient. It might, however, be difficult to gather in the good dollars from the Isthmus unless the faithful went down after them. Absent treatment has its disadvantages in the matter of revenue, however effective it might prove against pernicious malarial or yellow fever.

A more dangerous place to turn loose the Christian Scientist than the Canal Zone cannot be found. Under the Executive order, it is manifestly intended that he shall be compelled to report cases of contagious disease. But the Christian Scientist has no education in diagnosis. How then can he report a case of yellow fever or diphtheria or smallpox, if he does not know these diseases when he sees them? Recently, in New York, a "healer" was giving absent treatment to a child for a "slight sin," who at the time of the treatment was dead of diphtheria, a fact, of which the healer was unaware. The case was not reported because of the ignorance of the healer. Two other children in the family subsequently

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contracted the disease and were cured by the administration of antitoxin. What has happened in New York will happen in the Canal Zone and the practitioners of this heathen cult, masquerading under a false name will escape the punishment they deserve on the flimsy pretext that they are practicing the tenets of their religion and the United States Government, by its Executive, for the same reason gives them a complete immunity bath, whether they have killed their victim "gratuitously or for compensation."

Why not pardon Elijah Sanford!

He trusted in Providence for provisions on his fantastic cruise and although he violated the Federal law, it was through ignorance, and there was no evil intent in what he called his mind. Moreover, he was distinctly practicing the tenets of his religion. Christian Science practitioners allow children to die of diphtheria, adults to die of tuberculosis, the existence of which disease they deny, but our good President smilingly permits them to continue their good work on the Isthmus, whether "gratuitously or for compensation," because they are practicing the tenets of their religion. So was Sanford. Why pat the Christian Science devotee on the back and turn him loose, of all places in the world, on the scene of Col. Gorgas' achievements and clap poor Sanford in jail for ten years? Oh, but he was violating the Federal laws! Why suspend the law for one class on the ground that its practice is the tenets of a religion and punish an individual of another class for practicing the tenets of his religion? Death has followed in both instances as a result of insane beliefs, but there is jail for one sect and a safe conduct for the other. In sharp contrast to the executive order is the recommendation of the jury in the New York City case:

"We recommend that the District Attorney be requested with all diligence to press the cases already against the Christian Science practitioners now pending in the court to a speedy conclusion, and if the laws are not adequate to reach persons so practicing, that the Legislature of the State be appealed to to enact such laws as will protect the community of this State and prevent the recurrence of similar cases."

VACCINATION AGAINST TYPHOID.

RECORD OF THE UNITED STATES ARMY IN THE FIELD.
Table No. 1. Table No. 2.

	Spanish-American War.	Maneuver Division—1911.
Number of men	107,973	15,000
Cases of typhoid fever.....	20,738	2*
Deaths from typhoid fever.....	1,580	0

IN the December, 1910, issue of the JOURNAL there appeared the Wesley M. Carpenter lecture which had been delivered before the New York Academy of Medicine on October 20, 1910, by Major F. F. Russell, M.D., U. S. A. In this lecture Russell set forth in a most interesting and convincing manner all the available data concerning the prophylactic use of typhoid

vaccine. From the accumulated evidence he expressed the belief that we had at last a measure that would insure against us a repetition of the scourge of the Spanish-American war. The report of the Surgeon-General to the Secretary of War, of September, 1911, which supplies the figures in Table 2, verifies the prophecy of Russell and is a magnificent justification of the policy of the medical branch of the Department of War.

The recent mobilization on the Mexican border had many salutary effects. The greatest result, in the minds of sanitarians at least, was the evidence the medical division was able to contribute to the cause of preventive medicine. The efficacy of vaccination against typhoid is now, in the opinion of the Marine Hospital Service, an established fact. The broad general principles are so well proven that vaccination against typhoid is compulsory. In this step the United States has taken the lead since in all other countries where the method is used anti-typhoid vaccination is voluntary.

Let us briefly review some of the striking features of the recent test upon which their conclusions are based. Since vaccination was inaugurated and up to July, 1911, 45,680 men have been vaccinated. Among this number there have been only two cases of typhoid fever and no deaths. The remainder of the troops who have not been vaccinated have had a case incidence ranging around 0.28 to 3.03 per thousand with a mortality averaging seven per cent. When we include the navy statistics we note two deaths from typhoid among 2,752 persons vaccinated. These cases probably were already infected at the time of inoculation; the autopsy of one, five days after vaccination, revealed the pathology characteristic of the third week of typhoid fever. These two "excusable cases" constitute the total mortality among the vaccinated in the army and navy.

Until March, 1911, the system had not been subjected to any rigorous test such as field service imposes. Two outbreaks among small companies engaging in maneuvers of short duration had supplied comparative figures decidedly in favor of vaccination, but the small scale limited the results to suggestiveness only. But when 15,000 men were encamped for a period of four months, during a season of great heat we had conditions from which we might expect to draw accurate conclusions. Unusually good experimental conditions, which could not be improved upon even if the sole purpose of the mobilization had been the testing of the value of vaccination, were supplied by the establishment of the principal camps in the immediate vicinity of the two cities of San Antonio and Galveston. In both instances the people of the towns and the troops lived under almost identical conditions. Water, milk and to a large extent other food supplies were the same. Since men on leave would visit the cities, eating, drinking and sometimes sleeping in them, there were numerous instances where

* One case in an unvaccinated civilian teamster.

the soldiers were exposed to absolutely identical circumstances. Without the factor of vaccination the citizens had, in sewerage disposal and other sanitary arrangements, an apparently greater protection from typhoid than had the army. That these safeguards were outdone by vaccination is graphically shown by the following tables:

	San Antonio.	Camp.	Galveston.	Camp.
Population	96,614	12,801	36,981	3,000-4,000
Cases of typhoid.	49	1	192	0

Statistics of towns are for same periods.

It is not possible within the compass, nor is it strictly within the function of this editorial to give the further interesting details of the Surgeon-General's report. We are aware that papers by army officers have appeared supplying the information; that the president of the United States has drawn the attention of the country to this work in a laudatory address, and, that the public prints have featured it in editorials. However, we venture this repetition as a means of bringing the matter to your attention once again in order that we may emphasize the one feature that we feel carries the greatest value to our readers, namely: that these results added to the data accumulated by the English and German armies and to the experimental work carried out in various hospitals afford ample justification for the prophylactic use of typhoid vaccine by the general practitioner. As examples of opportunities for its use which may well fall within the scope of any individual's practice, we may mention the following:

(a) Vaccine immunization should be a routine procedure in the protection of hospital attendants and nurses.

(b) Private nurses should be given the opportunity to so protect themselves.

(c) Physicians might well forearm themselves against typhoid infection.

(d) Small communities where sanitary conditions are inadequate should have the benefit of such protection if they desire it.

(e) The control of epidemics would be greatly facilitated by the practice of such immunization. In the light of experience this should be made obligatory if the certain source of contagion is not discovered and removed immediately.

(f) It is the only practicable safeguard for one whose business or pleasure require travelling, with its exposures in various communities. This includes road salesmen, automobilists and campers.

It has been demonstrated that vaccination does not interfere with the discharge of camp duties and the same freedom would probably exist in civil life. But in the case of individuals whose business cannot be interfered with, it would be wise, in consideration of a possible moderate indisposition—a general reaction—to vaccinate late in the afternoon of alternate Saturdays, thus providing Sunday as an ample period of re-

cuperation. There is no longer any question as to the harmlessness of the procedure.

It is not to be imagined that vaccination against typhoid is the ideal method of preventive medicine any more than that pasteurization is the ideal of pure milk production. Both are measures of expediency and are advised as the best we can provide pending the prevention of infection by eliminating its source.

In the army, certainly in times of war, sanitary control presents very great difficulties and is often uncertain in its application. Here vaccination, which offers protection in advance of exposure which is obviously probable, will always recommend itself.

During the recent mobilization, because there was no actual warfare, there was considerable opportunity to apply rigorous sanitary measures, many of them innovations. These undoubtedly played a very important rôle in the remarkable conservation of health, but it is very generally admitted that these measures alone could not have accomplished so much. Vaccination is undoubtedly the key to the situation.

In times of peace, before the advent of anti-typhoid vaccination, the army, by the *intelligent, consistent* application of the *ordinary* principles of sanitation, maintained a typhoid rate so far below that of the country at large that they could, with justice, say: so long as we can keep to our barracks, our health remains reasonably good, but when we mingle with the citizens, our sick list increases tenfold. Now they protect themselves from us. They risk, with impunity, unsanitary conditions (camp life) certainly as bad as any civilized community enjoys.

Should we, the health officers of the citizens, not feel some degree of shame by these comparisons? Is it not time we profited by these lessons? All along we have complacently admitted that typhoid fever is a preventable disease, but what we have lacked is *action*. Let us then, put our so-called convictions into practical operation. The army has clearly defined the issue; the guide posts are placed; the pace is set.

Get busy!

C. Z. GARSDIDE.

THE ANNUAL MEETING.

ITEMS OF INTEREST FROM THE PRESIDENT.

The plans are rapidly maturing for the scientific program of the coming annual meeting of our Society, and through these editorials I desire to keep our 7000 members fully posted concerning the progress which is being made.

On the evening of December 15, 1911, a joint meeting of the Committee on Scientific Work, the officers of the sections, and the Committee on Arrangements, made up as follows, was held in the City of New York:

Committee on Scientific Work.

Chairman—L. H. Neuman, Albany; H. L. Elsner, Syracuse; T. J. Harris, New York City.

Section on Medicine.

Chairman—Dr. Henry L. Elsner, Fayette Park, Syracuse, N. Y.

Secretary—Dr. Harold Barclay, 68 East 56th Street, New York City.

Section on Surgery.

Chairman—Dr. Parker Syms, 540 Park Avenue, New York City.

Secretary—Dr. James N. Vander Veer, 28 Eagle Street, Albany, N. Y.

Section on Diseases of the Eye, Ear, Nose and Throat.

Chairman—Dr. Edward Bradford Dench, 15 East 53d Street, New York City.

Secretary—Dr. James Francis McCaw, Bank & Loan Building, Watertown, N. Y.

Section on Mental and Nervous Diseases, Eugenics and Medical Expert Testimony.

Chairman—Dr. Albert Warren Ferris, Sherman Square Hotel, Broadway and 70th Street, New York City.

Secretary—Dr. Edward L. Hanes, 98 Clinton Avenue, S., Rochester, N. Y.

Section on Public Health and Preventive Medicine

Chairman—Dr. Joshua Marsden Van Cott, 188 Henry Street, Brooklyn, N. Y.

Secretary—Dr. Allen Arthur Jones, 436 Franklin Street, Buffalo, N. Y.

Committee on Arrangements.

Chairman—Wm. J. Nellis, Albany; A. W. Booth, Elmira; Erastus Corning, Albany; S. G. Gant, New York City; A. G. Root, Albany; H. L. K. Shaw, Albany; E. A. Vander Veer, Albany.

The deep interest manifested by these officers is indicated by the fact that there were but four absentees out of the entire number. The entire evening was devoted to the question of the annual program, together with the general arrangements for the proper conduct of the meeting and its social entertainments. The activity of the officers of the sections was shown in their almost completed lists of members devoted to their particular field, by their large correspondence, and by the fact that their topics, subdivisions and even titles of papers are largely completed. The Section on Diseases of the Eye, Ear, Nose and Throat now has a bona fide list of men numbering 418; the Section on Mental and Nervous Diseases, Eugenics and Medical Expert Testimony has a list of men devoted to this department of work numbering 565; the Section on Surgery has a completed list numbering over 1400 and the Section on Public Health and Preventive Medicine has a list numbering 460. The balance of the membership will necessarily come under the Section on General Medicine.

Contrary to the ideas entertained by some of the more pessimistic members of our profession—that it would be difficult to secure enough

papers for a program made up of sections—our actual experience is showing that it would be easy to secure more than twice the number that could possibly be presented in the time at our disposal. It will be difficult to reduce the number of papers offered to the 150, which has been deemed the limit which can be handled by the sections. In addition to these we shall have two or three orations of a popular nature which will also require some time.

It is no exaggeration to state that our reorganization plan is not only creating wide interest, but general approval throughout the State. Hundreds of letters have been received and all contain a note of approval and awakened interest.

Some of the distinctive features of the program—a mention of men of prominence who are to appear before the Society—will form the basis of a short editorial for the February issue of the Journal.

WENDELL C. PHILLIPS.

A CIRCULAR LETTER FROM THE COMMITTEE ON ANIMAL EXPERIMENTATION.

ON page 49 of the NEW YORK STATE JOURNAL OF MEDICINE will be found a circular letter which has been sent by the Committee on Experimental Medicine to every member of the New York legislature. It briefly recites the history of the present war which is being waged against medical progress by well-meaning, but for the most part ignorant, or biased sentimentalists and ladies of means who prefer puppies to babies.

The Committee respectfully requests members of the legislature to give it a hearing before introducing any bill relating to animal experimentation, so that the merits of the case may fairly be stated by the representatives of the Medical Society of the State of New York.

After five years of warfare ending in nothing this seems a reasonable request. Both the legislature and the medical profession are entitled to a respite from this ceaseless agitation which has been fomented year after year principally by wealthy women, clad in the spoils of fur and feather, who unconscious of their own inconsistencies are willing that animals and birds should suffer torture and starvation for their personal adornment, but are unwilling that animal experimentation, which is for the ultimate good of both animals and human beings, should be conducted humanely and with as little pain as possible. Their pretense of regulation is a sham. What they really want is to absolutely forbid all animal experimentation. We trust that the members of the medical profession will not be misled by their specious profession and will refuse to give them aid and comfort.

Original Articles

THE INDEBTEDNESS OF POSTERITY TO THE PIONEER SURGEON OF THE MISSISSIPPI VALLEY.*

By JOSEPH D. BRYANT, M.D., LL.D.,

NEW YORK, N. Y.

Mr. President, Members of the Mississippi Valley Medical Association and Ladies and Gentlemen:

SOON after the request to address you, I thought it both proper and wise to get my bearings a bit adjusted, regarding the limits of this historic country, especially from a medical point of view. It quite naturally occurred to me that the region had to do only with those states lying in contact with the pure, crystalline current of the rectilinear Mississippi, itself. But, according to the historical sketch of Dr. Wishard, the "primitive trace" of the organization appeared at Vincennes, Indiana, in 1875, and hence its inception had no direct consanguineous relation with the Mississippi river, but instead with its great Eastern arm, the cool and unsoiled Ohio. And, also, it appears that responsible representatives of Indiana, Kentucky and Illinois were present at the time. But in 1883, after an unusual period of gestation, the Mississippi Valley Medical Association was born at St. Louis, and since then, says historian Wishard, with becoming pride, "its general activities have been in the Mississippi Valley, though really national in scope." Brother Witherspoon, not so long ago, in an earnest endeavor to explain to me the extent of the Mississippi Valley, with his arms outstretched, so as to include the whole creation, with eloquent emphasis said, "From the Rockies to the Alleghanies, from the Gulf to Canada;" and, no doubt he would include the latter now, had reciprocity been triumphant. Yet, my friends, regardless of the extent, you may be assured that in patriotic zeal, in scientific medical attainment and in womanly grace and virtue, the Mississippi Valley stands triumphant.

At first my guileless ambition and fond hopes prompted me to diligently enquire concerning the "pioneer surgeons" of the Mississippi Valley. But, a little later as the returns came in telling of the great distinction of the plural number, the plentitude of greatness and of number was such as to cause me to shipwreck my artless intention and speak of a singularly great surgeon instead. And, if in doing so I weary your patience or disquiet your expectations I am very sorry, and will offer as the reason that a truly great man's services to his kind should never become dimmed or forgotten, but always be kept clearly in view. Indulgently, therefore, regard "pioneer surgeons" as noted in the program, not as a misprint but

as evidence of the misconception by the speaker of the real magnitude of his first intent.

Believing now that I have adjusted myself, with a reasonable degree of care, to the prudent demands of an acutely impending situation, I will hasten the approach of the singular, in the topic of fame, coming from choice to my lot. In thus serving you, I hope that the poetic declaration of John Gay in the eighteenth century, viz:

"From kings to cobblers 'tis the same;
Bad servants wound their masters' fame,"

will not happen in this instance, at least.

I will at once, kind friends, with apologetic mien, introduce you to the thesis of the coming hour.

THE INDEBTEDNESS OF POSTERITY TO THE PIONEER SURGEON OF THE MISSISSIPPI VALLEY.

I had—as already intimated—chosen the plural of this important topic for my address, because of the bounteous blessings bestowed on the afflicted by eminent members of our calling, who lived and labored in the Mississippi Valley. The memories of the greatness of these sons are sacred to the people of the Mississippi Valley, and their attainments glorify our profession everywhere in the civilized world. The well-being and the happiness which they have spread abroad in the land measure well with that of the blessings of transcendent kind. The annals of the illustrious of this valley in other fields of attainment are happily emphasized by comparison with those of our profession here, for they too toiled and developed great aims, aided by resourceful methods and sustained throughout by sympathetic courage and prodigious self-reliance. The slowly unfolding means at the command of our profession, for the relief of human suffering and of operative consequences in surgical endeavor, are an emphatic proof of surgical advance, and also of long past courage and suffering, on the part of all concerned. How illustrative these rewards are of the fact that "men of courage are also full of faith."

The birth of important events for which man is accountable is his gift to the history of men, and often the chief characteristic of events themselves. Bacon once said, "Histories make men wise!" And, may it not be said, without gainsay, that truthful statements of nobler deeds make men proud of their kind, and of their craft, and to glory in their attainments? And since medical men are not less human than are others of mankind, it should be assumed that like others, they too, are proud of their kind and glorify their attainments. In this connection, however, I am constrained to say that, apparently, the members of our profession are not more, if quite as much disposed to honor the living of their calling, and to publicly cherish the names and deeds of their dead, as are other men to cherish and exalt the honored of their professions. If, indeed this is true, it follows quite reasonably that none of our kind should harbor resentful feelings of another,

* Address in surgery before the Thirty-seventh Annual Meeting of the Mississippi Valley Medical Association, Nashville, Tenn., October 17, 1911.

who is thought to have trivial regard for the living, and for the memory of the dead of our craft. At such times it is well to keep in view the fact that we ourselves, perhaps unconsciously, may have encouraged this state of mind, by somnolent attention or stoic manner, when lay praise was being ardently expressed of the ordinary and of the eminent of our profession. In any event, when we ourselves, shall fail to honor fittingly the memories of those who have given high station to our profession, and to show becoming respect for each other, we shall have assumed a responsibility therefor which constitutes a just obligation of momentous consequence righteously imposed on our professional pride and station.

Those pioneer heroes of the Mississippi Valley who engaged in the advancement of civilization, and those devoted to the creation of novel means of medical and surgical relief, are closely akin in importance to those whom poetry and sculpture have glorified for centuries. Who of these great men better portrays the hewers in the paths of civilized advance, and the defenders of the rights of men, than do Daniel Boone and Abraham Lincoln? Who more than these fearless leaders made friends with danger, the most of opportunity, and history that will endure for all time? The magnitude of the contributions of Boone and Lincoln to personal welfare, civilized comfort and happiness in our country, are well measured by similar blessings bestowed on the civilized world, by Dr. Ephraim McDowell, of the Mississippi Valley. Sincere conviction, indomitable courage, and faith in the triumph of honest endeavor were as much the armament of Dr. Ephraim McDowell when he engendered ovariotomy for the relief of suffering womanhood of the world, as of Abraham Lincoln when he proclaimed universal freedom for his country. The self-reliance and the courage of McDowell standing deliberately and practically alone in the face of the open and the hidden dangers of his task are an earnest of a kind of valor, possibly equalled, but not surpassed by statesmen or warriors of any land.

The great acts of illustrious statesmen are often the thoughtful products of the sage advice of able and experienced men, who, themselves are usually the chosen representatives of a numerous and militant constituency, and of whose support they rarely harbor uncertain doubts. The antithesis of all this and more is witnessed in the instance of Dr. McDowell, who in a small town, in December, 1809—more than a century ago—performed the first ovariotomy recorded in the annals of our profession. The operation was successful in the full meaning of the term. The patient recovered promptly and completely, and lived thereafter in comfort and usefulness for thirty-two years. And, my friends, it should not be overlooked that this beneficent act of single-minded, pure heroism was achieved at a time when the world knew not of anesthesia,

of antiseptics, of asepsis, nor of the fruitful diagnostic acumen and technical detail, later born of scientific deduction and practical experience. The potent factors of this picture of epoch-making achievement were, a reserved, highly intelligent, self-reliant and experienced practitioner of medicine and surgery, of a small town in Kentucky, Dr. Ephraim McDowell; also a submissive, trusting, suffering heroine, likewise of Kentucky—Mrs. Crawford. And, each was supported and directed by an abiding faith in the efforts of feeble man, as guided by omniscient, merciful Providence. Mrs. Crawford is reported as saying at the appointed time of operation, "Doctor, I am ready, please proceed at once." How vivid and brave was this utterance; much braver then, than if uttered in a period of established success. Quite akin too, it is, in sentiment and phrase to another utterance, first heard on May the first, 1898, at Manila Bay, when Admiral Dewey commanded, "Gridley, you may begin firing, when ready!" But, how radically different were the besetting circumstances of the occasions, and yet, how potentially momentous were these utterances. One, the former, was said in the presence of bespoken, grave personal consequences, by a suffering woman, afflicted unto death, to a resolute surgeon armed with honest convictions, and heroic determination in the discharge of honorable duty in the presence of mortal peril. Said, to one, who in fact was standing at the borderline of an achievement destined to illuminate the medical world, by the curing of un-numbered suffering women, of otherwise happy homes. The other, the latter—and please note the difference—was ordered by a mighty warrior supported by the panoply of aggressive power, yet, facing the uncertain conditions of defensive strength; but, like the former, in the presence of a duty of still unmeasured outcome, in the welfare of the human family.

I cannot, my friends, at this highly suggestive part of my address, forego expressing my keen appreciation for the well-informed, vigilant and self-reliant country practitioner, of medicine and surgery. The practitioner of large cities can avail himself at once of the best that is of diagnostic and curative attainment, through specialized sources of advanced medical and surgical understanding. Not so, however, with the far-removed country practitioner. He must do the best he can, and sometimes, no doubt, with the feeling that he may not know of the best that is on record. The breadth, nevertheless, of his general knowledge and the firmness of his self-reliance are apt to exceed these qualities in the development of his city colleague. Fortunately, however, diffusion of medical and surgical knowledge through higher educational requirements and the increased means of inter-communication, bring into nearer contact and practical union the vigorous forces of wise diagnostic and remedial efficiency.

Apropos of this advanced state of affairs, I will say that it is not impossible, and in fact wholly probable that the date of the personal achievement of McDowell would have been delayed, and perhaps prevented in 1809), if not altogether, had his convictions, his courage and his self-reliance been exposed to the influence of the doubts, the fears and the jealousies of his time or that of any other, unpreparedly circumstanced. We may well regard, therefore, the compact opportunity and the marvelous success of McDowell on December 13, 1809, as a surgical miracle, performed with the approval and under the guidance of an all-wise Power. As an earnest of the destructive opposition that also would likely have arisen from afar, had the profession known of the proposed "experiment," as so characterized by McDowell himself, kindly listen to what occurred at the time of the operation, in the little town of Danville, made historic by the deed. In testimony of the local frenzy that was incited in the lay people of the town, by their knowledge of what was taking place, we are told, "an angry and excited crowd of men were collected in the street, awaiting the result." And it is further said that had the outcome been fatal these "determined men would have shown no mercy to Dr. McDowell." And thus history would have added another martyr to the long list of those who had given sincerely their lives to the welfare of mankind. For, as Napoleon said, "It is the cause, and not the death that makes the martyr." Can it not be truly said that:

The virtues of a cause
Ease the martyr's pain;
The malice of the living
Makes of death a gain.

It was not willed that Dr. McDowell be of the list of dead martyrs, but of that of the living, hence the inflictions inspired in the envious, the timid and the ignorant of his profession kept pace for long with the evolution of the cause of his fame. Verily, had the threats of his neighbors been realized, the birth of ovariotomy could barely have been more tragic than it was, and McDowell himself, would have been spared the heartache of living immolation.

I will not attempt to recite what was said of McDowell and his "experiment" by those whose bad use of expression might well have shamed their patron saint—the prince of darkness! It is more comforting to note the presence of saving grace, later voiced by a powerful malcontent that signalized the time and the occasion of our hero. That just and courtly gentleman, the late Professor Samuel D. Gross, in his classic dedicatory address May 14, 1879, in honor of Dr. Ephraim McDowell, referred to Dr. James Johnson as "the very able and learned editor of the *London Medico-Chirurgical Review*, a journal widely circulated in Great Britain and in the United States," as one whose attacks were particularly

"savage and satirical," and especially so in connection with the first, the historic case of McDowell. Regarding this instance, Dr. Johnson is said to have exclaimed, with uplifted hands and apparently in holy horror, "Credat Judæus, non ego;" somewhat abruptly translated, "Let the superstitious Jew believe it, not I;" more graciously rendered, "Only a superstitious person will believe it, not I." Or as expressed in Bowery dialect, "Hully Gee, tell it to the Marines!" Subsequently, in 1827, in commenting on five ovariectomies of McDowell, but one of which had died, the remainder having recovered, Johnson published the following: "There were circumstances in the narratives of some of the first cases that raised misgivings in our minds, for which uncharitableness we ask the pardon of God and of Dr. Ephraim McDowell of Danville!"

How illustrative this avowal is of the sentiment that teaches: "The more we know, the better we forgive." Yet, notwithstanding the compassionate appeal for pardon uttered by Dr. Johnson, the extent of his publication and the influence of his personality, not all opposition was arrested and rarely, indeed, were imitators of the practice in evidence, during the following thirty-three years.

Dr. McDowell died in Danville, June 20, 1830, at the age of fifty-nine, universally respected and especially beloved by the poor to whose comfort and security he had been devoted. Accordingly, Dr. McDowell lived about twenty-one years after his initial victory in ovariotomy. And during the period he operated thirteen times, with eight cures, four deaths and one failure to complete the operation.

It was not until 1843 and 1844, and through the courage and capacity of Dr. John L. Atlee, and his brother, Dr. Washington L. Atlee, of Lancaster, Pennsylvania, that the operation of ovariotomy was firmly established as one of the procedures in surgery, said Professor Gross in his historic dedicatory address. The attainment of this distinction was not easily wrought, though more than a quarter of a century after McDowell had registered the original victory. It is recorded that the experiences of Dr. Washington L. Atlee, even at this comparatively advanced period of effort, was closely akin, though perhaps a more refined form of torture than that inflicted on McDowell. In the language of Dr. Washington L. Atlee, as quoted by Professor Gross, "Ovariotomy was everywhere derided, it was denounced by the general profession in medical societies, in all the medical colleges, and even by the majority of his own colleagues." Dr. Atlee further said, "I was misrepresented before the medical public and was pointed out as a dangerous man, and even a murderer. The opposition went so far that a celebrated professor, a popular teacher and captivating writer, in his public lectures invoked the law to arrest me in the performance of this operation." As Froude so aptly ex-

pressed it, "Men possessed with an idea cannot be reasoned with." And, how true it is that those who give birth to novel, helpful ideas must abnormally contend to establish their lawful parentage. The development of an idea concerning the welfare of man of spiritual or physical tenor, of social or business aspect, in fact of any character, antagonistic to the accepted plans of thought and action relating thereto, is automatically regarded as of fanciful, of dangerous or of destructive nature, accordingly as its realization would disturb the accepted order of things. In such contentions many estimable lives have been sacrificed, noble reputations ruined, and valuable possessions destroyed, and with the moral and physical aid of honorable, conscientious and brave men. It is thus that the people acquire substantial wisdom and the final betterments of mankind are attained. The pity is, and always will be, that patience, reason and judgment too often are opposed by impatience, ignorance and envy. No truism has yet been more frequently demonstrated than that "Man's inhumanity to man makes countless thousands mourn."

It is likely that the remoteness of Dr. McDowell from the centers of professional activity, his singular personality and inconspicuous environment, his unusual delay of reporting his epoch-making achievement and the faulty manner of expression employed, contributed much, indeed, to rouse earnest doubts in willing minds regarding the truthfulness of his claim, and of his title to priority. Regarding the question of priority in medical discovery, it may not be amiss to recall the opinion of the late Rev. Sidney Smith as quoted by Dr. Stephen Smith in his opening chapter, "The Evolution of American Surgery," of Volume one of the *American Practice of Surgery*, quite recently issued. In defining "Who is a discoverer" the Rev. Doctor declared "That man is not the discoverer of any art who first says the thing, but he who says it so long, so loud, and so clearly that he compels mankind to hear him." Dr. Howard A. Kelly, of Johns Hopkins Hospital, thus expressed his opinion of the matter: "Any claim to priority in medicine and surgery always rests, by consent of the profession, not upon the date of performance, but upon the date of publication." He further adds, "Reflection will only confirm this dictum by showing that the printed word is after all the only possible arbiter which can be appealed to when dispute occurs." It is no part of my intention to discuss these definitions. It is quite evident, however, that under the latter ruling, those who would shun literary effort or who recognize its fallacies, and those with dominating modesty or timidity should early see that their discoveries are convincingly expressed and grounded on well recognized and unquestionable authority. And, in this connection, it should be understood that neither Messrs. Munyon and Kilmer, nor Mrs. Lydia Pinkham are

in need of any special protecting agencies. And, again in this connection, we are frequently aroused from the inertia of satisfaction, by an anointed one of our calling, "who while not the first to say the thing, but who says it so long, so loud and so clearly that he compels mankind to hear him" and to believe him, often quite irrespective of the way of saying or of the justice of the claim.

According to Professor Gross the publication of the report of McDowell's first ovariectomy was characteristically neglected until eight years after its achievement. And, it then "was drawn up so loosely and carelessly as to be well calculated to elicit adverse criticism, as, indeed it speedily did, both at home and abroad, in a way not at all calculated to reflect credit upon the author as a literary and scientific man." It appears that Dr. McDowell was ill-fitted and strongly disinclined to literary effort of any sort, in fact, the antithesis in these respects of a multitude of his calling then, not a few of the present day. He lived in a different atmosphere from this of our time, and under far less strenuous determinations than now. Men then were not stimulated to as high degree of mental and physical effort as are those of to-day, and an achievement then was not as earnestly regarded as now—another upward lift in the evolution of human triumph over the mysteries regulating life's tenure. Kindly assume if you please, that, under circumstances like those of McDowell, out of a clear sky, as it were, that either Drs. Morton, Lister or Koch, had announced to the medical world respectively, the beneficence of anesthesia, the power of antiseptics and asepsis; the importance and individualities of tubercle bacilli, what would have been said? Pointed remarks akin to those addressed to McDowell would doubtless have been heard, and often with equal emphasis and asperity. If, but half a century ago, the wonders of the telephone and the relations of electricity to human affairs in other respects, and the aeroplane had been declared so near at hand, would not increased asylum accommodations have been in order, and likely occupied by protesting inmates, subject to pitying curiosity. So, after all, my friends, the differing degrees of seemingly irrational opposition to novel things depend quite largely on understanding, as tempered by the spirit of the expectant and obliging receptivities of the people. Who can truly predict the nature of the reception on earth to-day of Him, who was reviled and crucified about twenty centuries ago?

Every scientific truth here recounted has added important history to the civilized world, and is giving forth a bountiful, abiding heritage of health, comfort and happiness to the people. And, too, it should be recognized that the force of these truths gives enduring vitality to the sentiment of the title of our address—"The Indebtedness of Posterity to the Pioneer Surgeon of the Mississippi Valley." In this relation I

would say that I am not acquainted with an expression of greater economic potency than that of Swift's fancied gracious King of Brobdingnag, "who gave it for his opinion that whoever could make two ears of corn, or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country, than the whole race of politicians put together."

If this remark be true—and it has borne the test for years of utterance and of controversial reference—what then indeed, is the significance of him who has disposed of one common afflicting pain, one peculiar distressing condition, one sad fatal infliction of womanhood, where two were before? Or whoever, in any common infliction, could make two mothers healthy, or two families happy to bless the land where only one was before, would he not deserve better of mankind and do more essential service to his country than not only "the whole race of politicians put together," but also, few indeed of those who have thus far lived? The preëminent consequence of the achievement of McDowell in 1809, and its direct and indirect influences on the development of abdominal surgery, establish for McDowell for all time an exalted station in the sanctuary of human affairs assigned to august benefactors of the human race. And accordingly posterity should keep well in mind its indebtedness to McDowell for each step of the operation, the same as of the supreme event, itself, and with happy hearts and willing hands crown his memory with enduring emblems, on every fitting occasion.

Those of us who, figuratively speaking, were not born yesterday, can recall with vivid thought the earnest admonitions of our surgical teachers, regarding the sacredness from operative encroachment, of the peritoneal cavity. The high priests of the temples of Eastern faiths are not more insistent on the nonencroachment of their consecrated precincts, by unbelievers than were the chief surgeons of our country insistent on the noninvasion of the peritoneal cavity, before the triumph of Lister. I, myself (in 1869) sixty years after the initial success of McDowell, recall the earnest admonitory language of the late Professor James R. Wood regarding the dangers and the turpitude of careless trespassing on this forbidden territory. That, sixty years before 1869, McDowell, himself, was not well aware of the dangers of such trespass, especially in connection with his primal purpose, and was correspondingly impressed thereby, needs no imagination to determine. Since that time the professional indebtedness to McDowell has been constantly increasing, because of the superhuman courage which he then displayed; because of the tolerance of the peritoneum to exposure and manipulation then exhibited; because of the "open door" opportunities for cure, which laparotomy offered; finally, because of the successful

accomplishment of his purpose, and the prompt recovery and complete cure of the patient. As our good friend, Dr. McMurtry, has so well and forcibly expressed it, "*Pelvic and abdominal surgery began with ovariectomy; ovariectomy began with McDowell!*" Every celiotomy, past and prospective, has a birthright in the success of McDowell of one hundred years ago. Every cure accomplished through the portals of abdominal incision reflects honor and glory on the name and services of McDowell. And, my friends, what a heritage it is, as it were, born in a "manger" midst humble surroundings; declared and cherished by those, whose faith surpassed all opposition.

In the late Professor Samuel D. Gross' classic address, of May 14, 1879, the distinguished orator referring to ovariectomy said: "Its aggregate results in the hands of different surgeons have already added upward of 40,000 years to woman's life, and which is destined as time rolls on to rescue thousands and thousands of human beings from premature destruction."

Mr. President, what words of retrospective truth and of prophetic wisdom were these? Words born of indomitable courage of McDowell and abiding faith and valor of Mrs. Crawford, and since justified by the faith and courage of many, many others of her sex. Quite forty thousand years of life had then been added to womanhood, and with all of their sublime importance, in every civic channel of thought and action! Also, numberless dependent years added because of these; and boundless good and infinite happiness bequeathed by them to man, and to true womanhood. True now, as long, long ago, for then it was:

"Not she with traitorous kiss her Savior stung,
Not she denied Him with unholy tongue;
She, while Apostles shrank, could dangers brave,
Last at His cross and earliest at His grave."

The glorious bequest of 40,000 years of woman's life, realized during the seventy-year period of effort, was not achieved entirely through the kind indulgent disposition that characterizes the surgical conquests of the present time. Much, indeed, of the earlier and the major part of this period was pervaded by rancorous contention and malodorous assertion of men earnest in our calling who were well fortified with sincere conviction, abundant expression and adequate courage.

That endeavor shuns the hopeless and the fainthearted, yet, multiplies the strength of the eager for truth, needs no better demonstration than that developed by the early history of ovariectomy. Let us, therefore, my friends, on every fitting occasion, proclaim with unstinted measure our indebtedness to those disciples of McDowell, who labored and sustained the burdens of the creative period of ovariectomy, and thereby, long ago securely established its priceless worth and the glory of McDowell. Falling

in, on this roll of honor in the order of successful achievement is found the name of Dr. Nathan Smith, of New Haven, Connecticut, who operated July 5, 1821; of Dr. Alban G. Smith⁺ (or Goldsmith), of Danville, Kentucky, who operated May 23, 1823; of Dr. David L. Rogers, of New York, who operated September 4, 1829; of Dr. John Ballinger, of Charleston, South Carolina, who operated December 23, 1835; of Dr. John L. Atlee, of Lancaster, Pennsylvania, who operated June 29, 1835; of Dr. Alexander Dunlap, of Brown County, Ohio, who operated September 17, 1843; of Dr. Washington L. Atlee, of Lancaster, Pennsylvania, who operated March 29, 1844; of Dr. Edmund R. Peaslee, of New Hampshire, later of New York, who operated September 21, 1850. Dr. Peaslee died in 1878. He was a colleague and a kind friend of mine. His heartening manner and encouraging words in 1877, were potent factors in support of one whose opportunity of being officially called "professor," was then launched on the troubled sea of medical college uncertainties. Dr. Peaslee's physical and mental attributes were above those of most men. The latter dominated the former, which seemed to serve chiefly as their abiding place. An atmosphere of kindness and of thoughtful, conscientious care characterized his personality. Pale and lean and stooping he was, but strong and straight he looked to those in distress. Dr. Oliver Wendell Holmes facetiously said of him in 1841: "He looked as if his circulating capital might be a hundred or two red globules, with twice as many white ones, in half a pint of serum." This witty inventory should be regarded as suggestive, not conclusive, for the good people of Boston have rarely accorded to any one, more than they themselves possessed.

Time will not permit me to speak of the many other distinguished surgeons here and abroad who contributed decidedly in aid of final victory. It may, however, be interesting to know that according to Dr. Howard A. Kelly, up to 1850 only 18 American surgeons had done successfully, ovariectomy. But, my friends, what of the harvest since 1879, that is, of the last 32 years of opportunity and experience? A grand period of achievement with no special besetments; a period of emulation, during which each operator vied with his fellow in courting opportunity and perfecting the practice of ovariectomy. A period making ovariectomy safe, and blessed by the forethought and wisdom of Lister.

It appears, as already told by Professor Gross in 1879, that the then retrospective period of ovariectomy (1809-1879) had "added upward of 40,000 years to the woman's life," it having "rescued more than 2,000 women from an untimely grave;" thereby, giving to each sufferer about 20 additional years of physical comfort and consecrated service. If in 1879 upward of

40,000 years had been added to woman's life, what thus far must be the vital harvest of Professor Gross' prophetic period (1879-1911)—the last 32 years of experience? That thousands and thousands of human beings were rescued from premature destruction" is clearly apparent, and, the blessings arising therefrom, far and near, are matters of daily knowledge and of profound appreciation.

An earnest effort was made by Dr. William M. Ford, of the Woman's Hospital in the State of New York, to assemble the recorded cases of ovariectomy performed during the prophetic period of Professor Gross (since 1879), with the view of estimating again in years of life the magnitude of Professor Gross' prophetic blessing. It was, however, impossible to approximate an estimate entitled to comparison with that of Professor Gross made in 1879. And in this connection it should be clearly understood that ovariectomy, before 1879, was relatively infrequent and accorded special significance. It was then performed by a trained select few who each recorded the fact, the result, and the coincident items of importance, with a fidelity akin to that of religious zeal. Since 1879, particularly the last and major part of the time, ovariectomy has been performed with astonishingly good results, by a multitude of operators. In fact the operation has been so often and so successfully practiced, as to be more a matter of passing moment, than of real wonder, as formerly. Consequently, only cases of special significance were recorded faithfully, in private and public annals, thus practically ruining for related purposes, the total operative product. Really, the old fashioned ovariectomy has largely lost its identity in the newer and modern terms, oöphorectomy and the like. Ovariectomy is now aligned in operative importance with appendicitis in the interval, and other abdominal operations in which favorable outcome is so well assured as to quite inhibit the recording of simple cases. It was, therefore, regarded by us of greater value to utilize the results of a single well-known institution in the prophetic estimate of the life-saving of ovariectomy, than to attempt to base the comparison on a general estimate, whose numerical status would surely be more romantic than real. It should be said that this conclusion was reached only after patient, diligent and exhaustive examination had been made of the recorded literature of ovariectomy in the extensive library of The New York Academy of Medicine by Dr. Ford; and also, after unfruitful inquiry for aid in this regard, by the speaker, of those whose names and labors in this special field of culture are synonymous with broad opportunity, scrupulous care and great attainment. In each instance the response added conviction to the result of the search already made.

"For still the new transcends the old
In signs and tokens manifold."

* It appears that this noted surgeon was the associate of Dr. McDowell and assisted him in his historic case of 1809.

PRIOR to the advent of the X-Ray, the search for small foreign bodies embedded in the tissues was generally a tedious task, and often a most unsatisfactory one. There was usually no way of locating the object sought except by finding it; and to the difficulty of the search was often added the doubt as to whether the object supposed to be embedded was really present or not.

The X-ray has changed all this. We no longer hunt for a foreign body unless we know that it is present, and approximately where it is to be found. A single X-ray plate usually suffices to determine whether a foreign body is really present, and if so where the search should be made.

But even yet, with the aid which the X-rays afford, the search for a foreign body embedded in the tissues is often a tedious, unsatisfactory, and time consuming procedure. A single plate affords absolutely no information as to the exact size and shape of the object sought, nor as to its depth beneath the surface, and often proves distinctly misleading by showing the shadow of the object in one relation to a neighboring bone, whereas the object itself bears quite a different relationship. As for example, a broken piece of needle may be shown alongside of a metacarpal bone, whereas in reality it lies in front or behind or even on the opposite side of the bone. It is only when the foreign object lies perpendicularly to the X-ray target that the true relationship is shown; and to place the parts in this position is a matter of chance, as we do not know in advance exactly where the foreign body is situated. Two plates taken at right angles to each other furnish two planes at the intersection of which the object must lie, and greatly facilitates localization. But in many cases it is not feasible to obtain two plates taken at right angles to each other; and even when they have been obtained, the information afforded is insufficient and often unsatisfactory. For either or both of these plates may show the object in a false and distorted relationship; and yet from these more or less misleading plates one must endeavor to form a correct concept of the actual relationships so as to remove the object with the least possible dissection of parts. That this is oftentimes no easy task will be admitted by all who have had experience in this particular line; and it is only possible to one accustomed to interpreting X-ray plates, and who knows the relation of the parts when the plates were taken.

For the purpose of still more definite localization, two other procedures are commonly employed. First, fasten a piece of wire to the upper surface of the part; and on the plate will be shown the direction of the foreign object to the wire, and its approximate distance. The latter is too indefinite, however, to be of much value. Second, have two fine wires crossing the plate at right angles, with their point of intersection directly perpendicularly beneath the X-ray target. These lines show in which quadrant the

foreign object is located, which of course is a great aid in determining its exact position.

A still further advance in localization has been made by the utilization of stereoscopic plates. These, viewed through the stereoscope, present an accurate picture of the foreign object and the adjacent parts; and where they can be utilized are fairly satisfactory. But the making of stereoscopic reprints is a time consuming procedure, and the study of the plates themselves require considerable skill and special apparatus, and is not feasible in every operating room.

In addition to the difficulties inherent in the methods mentioned above, there is the fundamental objection, that they all assign to the surgeon the task of localization at the time of operation, instead of determining the localization for him in advance. And so far as I know, this latter has never been accomplished.

In order to determine the position of any body in space, three fixed points are necessary from which to measure. And hitherto no method has ever been devised for measuring the exact distance of an embedded object from three fixed points on the body surface. A close approximation is obtained by the use of pointers, but this again requires special apparatus, is cumbersome, and the determination requires considerable time. It is to avoid these difficulties and inconveniences that the following method is presented. It is simple, accurate, requires no special apparatus, and is applicable in all cases where two distinct negatives can be taken on the same plate.

The method is based upon the physical law that light travels in a straight line, and upon the geometrical proposition that the corresponding sides of similar triangles are proportional to each other.

Let us assume that we have a plane surface, WXYZ, on which stands a triangular pyramid, mdeg, m being the apex, and md one side, which is perpendicular to the base, deg. Let us furthermore assume that this pyramid is intersected by a plane surface, abc, parallel to the base, deg. Then we have two similar pyramids, mdeg, and mabc, whose sides and bases are triangular and whose corresponding edges must be proportional. Therefore,

$$ab : de :: ac : dg :: bc : eg :: am : dm, \text{ etc. and} \\ ab = \frac{am \times de}{dm}; \quad ac = \frac{am \times dg}{dm}; \quad bc = \frac{am \times eg}{dm}.$$

Now at the base of the pyramid mdeg, connect one angle, g, with the opposite side de, by a vertical line gh; and similarly, in the pyramid mabc, connect the angle c, with the opposite side ab, by the vertical line cj. Then

$$ac : dg :: cj : gh :: aj : dh :: am : dm, \text{ etc. and}$$

$$cj = \frac{am \times gh}{up}; \quad aj = \frac{am \times dh}{dm}.$$

Now let mn be a line parallel to the plane WXYZ, and n a point in that line; and let c be

the point of intersection of the plane abc with the edge mg of the pyramid mdeg. Connect n and c by a straight line, and prolong this to f, in the plane WXYZ. Therefore by the law of similar triangles,

$$ad : am :: cg : cm :: fg : mn, \text{ etc.}$$

or since $am = dm - ad$,

$$ad : dm - ad :: fg : mn.$$

Therefore

$$ad \times mn = (dm \times fg) - (ad \times fg),$$

$$(ad \times mn) + (ad \times fg) = dm \times fg, \text{ and}$$

$$ad (mn + fg) = dm \times fg, \text{ and}$$

$$ad = \frac{dm \times fg}{mn + fg}.$$

Furthermore, since the plane abc is parallel to the plane deg, which latter is part of the plane WXYZ, $cu = ad$, and

$$cu = \frac{dm \times fg}{mn + fg}.$$

Now in the first equation, $ab = \frac{am \times de}{dm}$, substitute for am its equivalent $dm - ad$, and for ad its value $\frac{dm \times fg}{mn + fg}$, and we have

$$ab = \frac{dm - \left[\frac{dm \times fg}{mn + fg} \right] de}{dm}. \text{ Factoring, we have}$$

$$ab = \frac{dm(mn + fg - fg)}{dm(mn + fg)} de; \text{ and}$$

$$ab = \frac{mn \times de}{mn + fg}.$$

Similarly,

$$ac = \frac{mn \times dg}{mn + fg};$$

$$bc = \frac{mn \times eg}{mn + fg};$$

$$cj = \frac{mn \times gh}{mn + fg};$$

$$aj = \frac{mn \times dh}{mn + fg}.$$

Now let prs be a plane surface above and parallel to the plane abc; and let its edges pr, rs, and sp, be in the same vertical planes and have the same lengths as the corresponding edges ab, bc, and ac of the plane abc. Then

$$ab = pr, bc = rs, ac = ps, \text{ and } cj = ks.$$

Substituting in the preceding equations for ac and cj their equivalents ps and sk, we have,

$$ps = \frac{mn \times dg}{mn + fg}; \text{ and}$$

$$sk = \frac{mn \times gh}{mn + fg}.$$

Let us now apply these equations to the problem of locating a foreign body embedded in the tissues. Suppose that this is a bullet embedded in the thigh.

Let m be the position of the X-ray target during the first exposure, and n its position during the second exposure. Let WXYZ be the plate on which the two exposures are made. For convenience, I usually place the X-ray tube so that the target is exactly 16 inches above the plate; and after the first exposure move the tube 8 inches, from m to n, care being taken that the vertical distance of the tube from the plate remains the same. Then in the formulæ, $dm = 16$ inches, and $mn = 8$ inches. Let pr be a marked line on the surface of the limb in the plane prs, and pq a short piece of wire in that line—a pin is convenient. The length and direction of line and wire are immaterial, except that they must be in a plane horizontal to the plate, and one end of the wire—head of pin—must be at a fixed point p, perpendicularly beneath the target in its first position at m. Let c represent the bullet, and abc the plane in which it is situated. Then cu or ad is the distance of the bullet above the plate; su or pd is the total thickness of the limb; and $su - cu = cs$ or $pd - ad = pa$ is the distance of the bullet below the surface next to the tube.

Now if one exposure is made with the target at m, the wire removed, and another exposure made with the target at n, then on the developed plate, the shadow of the wire pq will be seen at de, and the shadows of the bullet at c will appear at f and g. Measure the three distances, fg, dg, and hg; that is, from the bullet in its first position, measure the distances: 1st, to the bullet in its second position; 2nd, to the fixed end of the wire—pinhead—marking the perpendicular mpd; 3rd, to the wire on a vertical direction, i. e., the distance to the wire on a line at right angles to the wire.

Suppose that in our example of the bullet in the thigh, we find that fg, the distance between the two shadows of the bullet amounts to 2 1/4 or 9/4 inches; that dg, the distance to the fixed end of the wire amounts to 17-8 inches; and that hg, the vertical distance to the wire amounts to 1 5/16 inches. We have already assumed that the target was 16 inches above the plate and was moved 8 inches. Therefore $md = 16$ inches and $mn = 8$ inches.

Then the height of the plane abc, in which plane the bullet lies, above the plane of the plate deg, is given by the equation

$$ad \text{ or } cu = \frac{dm \times fg}{mn + fg}, \text{ or } \frac{16 \times 2\frac{1}{4}}{8 + 2\frac{1}{4}} = \frac{144}{41} = 3 \frac{21}{41} \text{ in.}$$

Or, since fg (in this case 2 1/4 inches) can always be expressed as a fraction in form $\frac{x}{y}$, ($\frac{9}{4}$)

in which x is the numerator and y the denominator, the value of cu is likewise given by the equation,

$$cu = \frac{dm \times x}{(mn \times y) + x} \text{ or } \frac{16 \times 9}{(8 \times 4) + 9} = \frac{144}{41} = 3 \frac{21}{41}''$$

And the position of the bullet in the plane abc is given by the equations

$$ac = \frac{mn \times dg}{mn + fg} \text{ or } \frac{8 \times 1 \frac{7}{8}}{8 + 2 \frac{1}{4}} = \frac{15}{10 \frac{1}{4}} = \frac{60}{41} \text{ inches}$$

$$cj = \frac{mn \times gh}{mn + fg} \text{ or } \frac{8 \times 1 \frac{5}{16}}{8 + 2 \frac{1}{4}} = \frac{10 \frac{1}{2}}{10 \frac{1}{4}} = \frac{42}{41} \text{ inches}$$

But as we cannot measure these distances ac and cj within the substance of the limb, we must project them onto the surface and measure off the equivalent distances, ps and sk . Then

$$ps = ac = \frac{60}{41} \text{ inches;}$$

$$sk = cj = \frac{42}{41} \text{ inches.}$$

That is to say, the bullet lies $3 \frac{21}{41}$ inches above the lower surface of the limb in contact with the plate, and perpendicularly beneath a point on the upper surface of the limb, which point is located $60/41$ inches from the fixed end of the wire and $42/41$ inches from the wire, measured vertically. If the distance of the bullet beneath this point is desired, then the total thickness of the limb at that point minus the depth of penetration from the plate side gives the depth from the upper side. If in our example we suppose the limb to be 5 inches through at the level of the wire, then

$pd - ad$ or $su - cu = ap$ or sc , or $5 - 3 \frac{21}{41}$ inches = $1 \frac{20}{41}$ inches, which is the depth of the wire beneath the upper surface.

While the explanation may appear somewhat complicated, the technic is extremely simple. Make two exposures on one plate, moving the tube a definite distance in a horizontal direction for the second exposure. And for the first exposure lay on the upper surface of the part a short wire with one end directly beneath the target. Then after making the exposures and developing, measure the three distances and calculate the three formulæ as explained above.

For practical purposes it is usually sufficient to calculate only two formulæ, 1st, that giving the height of the object above the plate, and 2nd, that giving the distance from the fixed end of the wire. The vertical distance to the wire can usually be estimated with sufficient accuracy by noting on the plate the angle between the wire and the bullet in its first position, and on the surface of the part making the angle between the wire and the point beneath which the bullet lies to correspond: (*i. e.*, $edg = rps$).

In searching for a large sized object, as a bullet, the localization of one edge, or of a point half way between the ends, may be sufficient. But in the case of a needle it may be necessary

to locate both ends. In this case we let c represent the point of the needle and f and g the shadows of the same; and c^1 the eye, and f^1 and g^1 the shadows of the same. First, calculate the formulæ using the values, fg , eg and dg , and then repeat using the values f^1g^1 , eg^1 and dg^1 .

In practice it is necessary to use a little care in laying off the surface points so that they are equidistant from the plate, or that allowance be made for any difference. In cases where the surface is irregular and varies in thickness the total thickness of the part must be measured through the point beneath which the object lies. And in case the part does not lie in contact with the plate, the intervening space must be allowed for in estimating the depth from the surface of the part itself.

It is only comparatively recently that I worked out these formulæ, and I have only had the opportunity to try them in a few cases. But they have proved very satisfactory, as in fact they are bound to do. For if the few requisites are complied with, the measurements made fairly accurately, and the computations done correctly, the point required is located infallibly.

The only case in which I have failed was one of bullet in the brain.

Here, a poor picture failed to reveal the wire, and exact localization was impossible. But by observing the displacement of the shadow of the bullet which had occurred as a result of moving the tube, it was possible to calculate that the bullet had passed about two-thirds the way through the head, and that the case was inoperable. At the autopsy, a few hours later, the bullet was found in the position indicated.

Summary. If we make two exposures of a part on the same X-ray plate, displacing the tube horizontally a definite distance for the second exposure, but keeping it at a certain fixed vertical distance above the plate; and if during the first exposure we place upon the upper surface of the part a short straight piece of wire horizontal to the X-ray plate, with one end of the wire vertical to the tube in its first position; then the exact position of any imbedded foreign object is given with mathematical certainty by the following formulæ:

$$I. \quad cu = \frac{dm \times fg}{mn + fg}; \text{ or } cu = \frac{dm \times x}{(mn \times y) + x};$$

$$II. \quad ps = \frac{mn \times dg}{mn + fg};$$

$$III. \quad sk = \frac{mn \times gh}{mn + fg}$$

$$IV. \quad su - cu = cs.$$

Where,

dm = height of target of X-ray tube above plate.

mn = distance tube is moved.

fg = displacement of shadow due to displacement of tube.

- gd=distance on plate from 1st position of bullet to fixed end of wire.
 gh=vertical distance on plate from first position of bullet to wire.
 cu=height of object above plate.
 su=total thickness of part.
 cs=depth of object beneath upper surface.
 ps=distance of point beneath which object lies from fixed end of wire.
 sk=vertical distance of point beneath which object lies from the wire.
 x=numerator and y denominator of fg, when expressed in fractional form.

The first of these formulæ is by all means the most important. For in a large proportion of cases, at least, the lateral position of the embedded object can be estimated with approximate accuracy from a single plate; but no idea at all can be obtained as to its depth, and this the first formula supplies without even the slight bother of marking the surface with the wire. Simply the displacement of the shadow gives the depth above the plate.

Addenda. While a more extended experience with the method described above has served to confirm our estimate of its value and general utility, I have found that in certain cases a slight modification in technic is desirable.

In a certain proportion of cases, especially those of the head and trunk, it is impossible to obtain two satisfactory negatives on one plate; and where this is the case, two plates will serve as well, if the following conditions are complied with: First, Provision must be made so that the plates can be changed without disturbance of the part to be radiographed. This is provided for in the plate changers for stereoscopic radiography. Second, Two fine wires crossing each other at right angles should be placed in the plate changer, just above the level of the plate, so that the wires appear as cross lines on each negative. Then by holding the two negatives against a strong light, so that the cross lines correspond, and one shadow shows through the other plate, the displacement of the shadows can be measured directly. Or, by measuring to the cross lines, the displacement can be determined indirectly.

In case stereoscopic plates are made, as is often desirable, the movement of the tube will be only 3 inches, the displacement of the shadows will be correspondingly smaller, and formula I. becomes

$\frac{16 \times fg}{3 + fg}$ where fg is the displacement of the shadow. Similarly, 3 must be substituted for 8 as the value of mn in the other formulæ.

Where two plates are used, a slight error is introduced by making the cross lines exactly correspond. For by comparing these lines on a plate on which two negatives have been taken, it will be seen that there is a slight displacement in the cross lines themselves. But as this dis-

placement never amounts to 1/32 inch, even when the tube is moved 8 inches, the resulting error can never amount to as much as 1/16 inch, an error too small to be of consequence.

In addition to its use for the localization of foreign bodies, this method is adapted to the study of relationships after fracture. In certain cases it is impracticable to obtain two plates at right angles to each other. If then, two stereoscopic plates are made, or two negatives are taken on one plate according to the method described, the displacement of the shadows will reveal whether there is any displacement of the broken ends in the vertical line, and if so which end is above the other, that is, farthest from the plate.

The plates may present any one of the following four conditions:

- I. Vertical negative shows no lateral displacement of the fractured ends.
 Oblique negative shows equal displacement of shadows of both ends.
 Then there is no displacement of ends laterally nor vertically.
- II. Vertical negative shows no lateral displacement of the fractured ends.
 Oblique negative shows unequal displacement of shadows of the two ends.
 Then there is a vertical displacement of one end, and the end whose shadow shows the most displacement is the farthest from the plate. In difficult cases this will serve to show which is the overriding fragment.
- III. Vertical negative shows a lateral displacement of one end.
 Oblique negative shows equal displacement of shadows of both ends.
 Then there is a lateral but no vertical displacement. For if the displacement of the shadows of the two ends is the same, their vertical distance above the plate is the same.
- IV. Vertical negative shows a lateral displacement of one end.
 Oblique negative shows unequal displacement of the shadows of the two ends.
 Then there is both a lateral and vertical displacement of one end of the bone in relation to the other; and the end whose shadow shows the greatest displacement is the farthest from the plate.

SPLANCHNOPTOSIS AND ITS RELIEF.*

By ALBERT T. LYTLE, M.D.,
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PERMIT me to open my paper with a statement of facts made to forestall a possible accusation of plagiarism. In an article by Dr. William Francis Campbell, entitled "Developmental Defects of the Abdominal Viscera and

* Read before the Eighth District Branch at Dunkirk, N. Y., September 27, 1911.

their Surgical Significance," read before the Medical Society of the State of New York, April 19, 1911, and published in the September, 1911, number of the NEW YORK STATE JOURNAL OF MEDICINE, are theoretical statements the exact parallel of my own. The studies which resulted in the writing of my papers were begun in 1898; the ideas advanced were first formally presented before the Buffalo Academy of Medicine May 11, 1909, in a paper entitled "Splanchnoptosis;" next as a part of a president's address delivered before the Alumni Association of the Medical Department of the University of Buffalo on May 25, 1909; and again expanded in a paper of the same title read before the Roswell Park Medical Club of Buffalo, on April 10, 1911.

Splanchnoptosis as used in this paper means that the abdominal organs, one or more, wholly or in part, are to a greater or less extent dislocated or dragged from the average normal planes in which they are supposed to have been placed during development and in which they are supposed to normally functionate.

At present individuals known as splanchnoptotics seem to fall into two classes. In one group, which might be called "congenital," the ptosis is but one sign of a general organic defective, while in the other group, which might be called "acquired," the ptosis is the sequel of some previous disturbance in an otherwise normal individual.

The determination of splanchnoptosis as a casual factor depends upon the proper interpretation of abnormal physiology and abnormal anatomy.

It is comparatively easy to diagnose a ptosis of the solid organs notwithstanding all the abdominal viscera are said to be freely movable. On the other hand, the motility as well as the mobility of the hollow organs about their points of attachment makes it quite difficult to diagnose a positive ptosis unless of considerable degree.

From repeated observations it seems probable that while a demonstrable ptosis of hollow organs may exist without like displacements of solid ones, yet a proven ptosis of one abdominal organ is a sign of ptosis of all.

Owing to the inherent difficulties of a correct diagnosis of slight yet symptom-producing degrees of splanchnoptosis, a greater number than suspected suffer the effects of this abnormality. Usually it is only when patients having advanced degrees with marked gastro-intestinal conditions seek relief, or when a floating kidney is accidentally discovered that splanchnoptosis is ever considered. While women, because of anatomical differences suffer from the greater degrees of such displacement almost exclusively yet men do not fall so very far behind as sufferers from the lesser degrees of splanchnoptosis. I am quite convinced that the condition is frequently the cause, though unrecognized, of the unsuccessful treatment of mild indigestions, gastro-intestinal neurasthenias, autointoxications and

chronic constipation, associated with static positional errors (backache), so called flat-foot and pelvic displacements.

Necropsy statistics supporting the frequent occurrence of splanchnoptosis and its probable relation to abnormal function are meager because the horizontal decubitus tends to correct the displacements while post-mortem change tends to fix the ptotic organs thus returned in a position assumed to be their normal.

Undoubtedly aberrant function of the organs under consideration is often simply and only an indication of the action of other causative factors; unquestionably abnormal function may be an active cause in aggravating splanchnoptosis and so making positive its presence, yet such does not vitiate the contention that primarily aberrant function was initiated by the effort to overcome the handicap of aberrant position.

The subjective symptomatology, the result of abnormal function and reflex irritation, is due to continuous tension, compression and trauma of the splanchnic nerves and blood and lymph vessels. Nervous dyspepsias, intestinal indigestions, constipations, neurasthenias, adynamia, erethism, in fact all the esthesioneuroses, myomalacia, osteomalacia, skin pigmentation, anemia, transient edemas are all present in splanchnoptosis in greater or less profusion and prominence. Only after elimination of the other causes for their presence do they have value in making certain a diagnosis.

The objective symptomatology is the result of defective body development and of abnormal position and mobility of the abdominal organs.

Defective body development is shown in a general frailness, a toneless musculature, relaxed ligaments, a marked lack of vigor, a hypersensitive nervous system, contour irregularities, faulty static position, the absence of the 10th and even of the 9th costo-cartilages, the occurrence of hernias, the appearance of a traverse sulcus below the ziphoid angle and above the umbilicus, pronounced protrusion of the abdomen between the umbilicus and the symphysis pubis even to overhanging.

Abnormal position and mobility of the organs are shown by the presence of nephroptosis, of hepatoptosis, of splenoptosis, the finding of the greater curvature of the stomach always at or below the level of the normally placed umbilicus while the upper border is also constantly below the normal level; the determination of colonic displacements especially of the sigmoid, the transverse colon and the cæcum; any or all of these coupled with functional and reflex disturbances make the diagnosis positive.

The means to be used to determine anatomic aberration of the organs are palpation, percussion, auscultatory percussion, bougies, lavage tubes, electric illumination and the X-ray. The hollow organs can be filled with air, gas or liquid to aid in determining outlines by percussion; while bismuth, iron or zircon distributed through

their lumen sometimes aids in developing contrasting shadows in the radiograph. The last mentioned aids frequently have serious drawbacks and therefore require caution in their use.

The future of individuals suffering with splanchnoptosis is certainly not very hopeful so far as concerns complete return to normal conditions and to freedom from discomfort. At best such individuals, even if carefully treated, will have recurrent attacks of illness of greater or less severity while if untreated the condition produces continuous ill health which often is a grave menace to life. Splanchnoptosis handicaps one in the successful achievement of rational ambitions, in the performance of the best work, mental and physical, of which one may be capable. Splanchnoptosis by originating improper function produces chronic invalidism, tends to shorten life, lessens resistance to the invasion of disease and creates greater susceptibility to disastrous outcome from disease.

The functional and reflex symptoms are amenable to a considerable extent to treatment, while the anatomical defects are corrected with difficulty if at all.

It seems to me that splanchnoptosis bears the same relation to the organism that eye and other reflex strains do; that proper treatment to relieve the ptosis has about the same therapeutic value as the wearing of properly fitted glasses, the correction of nasal deformities, the reduction of anal and rectal irregularities and the use of dentures in oral defects.

The origin of splanchnoptosis is due to factors that reach farther back in the history of the human race than the short lifespan of the individual so possessed. Evolution teaches that by natural selection man inherited those anatomical shapes and positions found best fitted to serve in the conditions of his present existence, yet in the development never losing completely the archetype and not infrequently showing a strong atavistic tendency.

All vertebrate life found that existence was best conserved by suspending the thoracico-abdominal organs from the vertebral column enclosed and sustained by the ventral walls, all lying to the earthward side of the column. Further development added the diaphragm and removed the ribs both anterior and posterior to the dorsal vertebrae. These changes left the trunk or soma in shape like two truncated cones with their bases coincident at the level of the diaphragmatic zone, one enclosed by a practically complete bony structure, the other almost by muscle alone, the summit of the thoracic cone being at the level of the first dorsal vertebra, and the summit of the abdominal cone being at the level of the brim of the true pelvis. A glance at any of the four-footed animals will show the greatest trunk circumference to be in a zone at about the level of the tip of the xiphoid appendix from which it rapidly diminishes in diameter both cephalad and caudad, but particularly so in

the direction of the pelvis. The effect of this shape is to crowd the contents of both cones toward their respective bases and into as compact relation as is consistent with strong normal function, to so put the body mass that the position of its center of gravity makes for great stability under all conditions, and to so maintain intra-abdominal pressures as constantly to support the organs in their respective planes.

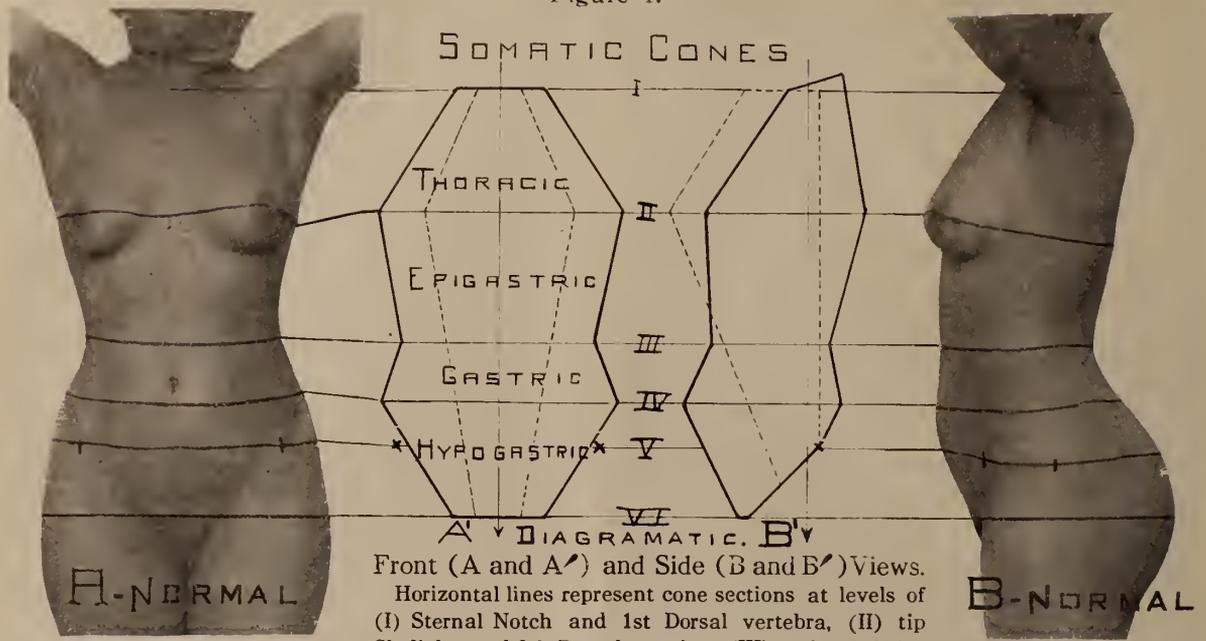
The elevation of the quadruped to the biped immediately changed the direction of the force of gravity from acting at right angles to the spine to being parallel to it; it changed the tendency of the abdominal organs to move toward the base of the abdominal cone to one of motion toward the apex of that cone, while the thoracic contents tended to move with greater force toward the base of the thoracic cone, thus intensifying the abnormal effects of the intra- and extra-abdominal pressures. These disastrous trends have produced changes in the shape of these cones; planes passed through both cones at any level demonstrate that the lateral or right to left diameters have increased while the ventro-dorsal diameters have decreased; especially has the abdominal cone been altered so that it may now be considered as being made up of three cones, shown by a contraction at about the level of the transverse colon, 10th costo-chondral junction, and by an expansion at about the level of the anterior superior spines. In the female the last mentioned changes in the primitive type are accentuated by the great pelvic capacity which again is especially noticeable in civilized woman.

Developmental changes also influence the effect of the above mentioned evolutionary ones. The inactivity and enervation of beneficent civilization with its suboxygenation, overeating, excessive drinking, improper dressing, nerve exhaustion, disease and autointoxication, all reduce the tone of those physiological forces that maintain a proper standard of intra-abdominal pressure antagonistic to extra-abdominal pull, whereby the very movable organs constantly occupy those planes in which their functions are best performed, in which no drag is made upon sensitive nerves and in which no stagnation of circulating fluids takes place.

In the individual accidental causes may pave the way for relaxation of normal supports and the unbalancing of intra-abdominal pressures,—childbearing by weakening abdominal walls and the pelvic floor; pelvic and abdominal tumors both before and after removal; obesity; dropsy, whether from heart, kidney or liver disease; exhaustive diseases like typhoid; traumatism to abdominal walls from accident or design; peritoneal adhesions; anomalous position of organs, all are possible active causes in the production of splanchnoptosis.

During the first two decades of life, the formative period, civilization embodied in the nurse, the parent, the teacher and society has heretofore seemingly done the best it knew how to lower the

Figure I.



10th and 11th ribs, (IV) crests Ilii, (V) Anterior Superior Spines of Ilii and Promontory of Sacrum, (VI) upper border Pubes. * Broken lines show relation to archetypal cones. Vertical lines pass through center of gravity.

tone and quality of bone, ligament, muscle and nerve. The nurse by compelling the babe through blind prejudice and custom, to lose its budding selective individuality, to become a copy of a misconceived ideal model of perfection; the parents by injudiciously feeding and by improperly dressing the child, by promoting precocity, by restricting initiative and by limiting and restraining free out-of-door life; the teacher by forcing mental at the expense of physical development, by permitting and prolonging the taking of strained and faulty attitudes and locations in the schoolroom, by ignoring physical and mental variants from an assumed and arbitrary standard; and society by compelling obedience to the more than frequently absurd decrees of fashion as to dress, exercise and pleasure. As one writer upon another subject, discussing a specific instance of misguided training during these critical 20 years, says: "The result . . . is often tragedy of the life, and always at least morbidity, abnormalism and handicap."

It is impossible to change or eliminate the evolutionary etiology of viceroptosis; it will eventually evolve alterations that will work in harmony with the variations from the archetype, consequently the developmental and the accidental factors are the ones demanding attention so that natural selection will make for a higher and not a lower type. "Back to nature" is hardly applicable here because a forward and not a backward movement is the rule of evolutionary progress. Yet "back" to those "natural conditions" which conduce to sturdy, resistant, capable race development as opposed to "hot-house" progress to maturity is surely the indicated way to preven-

tion. Improved hygiene,—racial, national, municipal family, and last if not really first, individual co-operating and progressing with civilization,—in splanchnoptosis as in all other physical conditions means an improvement to the elimination of detrimental factors. Today prophylaxis depends entirely upon an effort to secure better growth and development of the individual. In response to the dictates of conscience and the cry of charity, society and medicine are fostering much of physical degeneracy, are delaying the summary action of the survival of the fittest in so far as the individual if not the race is concerned. In order to neutralize the negative action of this beneficence a greater positive impulse must be imparted to the individual by a greater promotion of all those artificial means which will increase the power to neutralize the evil influences of the increased admixture of degeneration and of the increased depletion from the rapid pace at which the race is moving. Fortunately such power is now nourished by the physician in his protection of the unborn, in his care of the newborn; by the municipality in its regulation of those pure-food, building, sanitary and public health laws especially dealing with social conditions in large communities, with water supplies, with the tenement, the school and the factory, and with the physical recreation of the child. Proper food, pure air, increased daylight at all times, regulated exercise, lessened nervous excitement, plenty of sleep during infancy, childhood and puberty are sure to prevent the softening of muscle and bone, the relaxation of ligament, the hypersensitiveness of nerve, which produce faulty carriage and

faulty balance in abdominal pressures, whereby visceroptosis becomes not a tendency but a positive vicious activity.

As splanchnoptosis so frequently becomes pathologic after parturition, at each such period in a woman's life particular care should be taken to correct the loss of intra-abdominal pressure by putting the relaxed abdominal wall into the shape of the prototypal abdominal cone by means of a proper brace, and by a careful regulation of such hygienic measures as will induce an early return to normal tone of muscle and ligament. Such may also be said of convalescence from exhausting disease and from pelvic and abdominal operations.

I believe that most if not all observers will admit that a very large percentage of women subjected to physical examination show a kidney more or less out of the normal plane. Of this percentage a large proportion offers no complaint immediately traceable to such displacement, yet heretofore almost the entire symptomatology has been ascribed to this ptosis, and kidney fixation advised; but lo! the symptoms remained after a reasonable post-operative period. That nephroptosis is but a sign of a greater abnormality, but a measure of safety on the part of the organism, compels the thought that in reality nephroptosis is physiologic and not pathologic. Plastic surgery for hepatoptosis has been very infre-

quent. At present a few surgeons in selected cases are hanging up the displaced hollow organs by a sort of ventro-fixation while in other cases they are shortening the elongated ptotic tubes by removing portions of the offending bowel. Whether these procedures will give sufficient relief to balance the risk will require, as with nephropexy, time to determine.

The symptomatic treatment will always occupy the foreground no matter what special way may be used in an attempt to correct the deformity. Drugs and hygienic means are bound to give a measure of relief, but owing to the protean manifestations they are almost innumerable and often conflicting as to effect.

The treatment of dyspepsias depends upon whether they be secretory, motor or nervous. They demand a consideration too long to be even hinted at in this paper.

Neurasthenic symptoms may be relieved by the rest cure; even the horizontal position for a few hours a day seems to be beneficial. Here psychotherapy, hydrotherapy, chierotherapy, electrotherapy, diet and medication all have their application.

Faulty carriage and general bony, muscular and ligamentous atony require carefully regulated diet, massage, exercise, rest, freedom from care and anxiety, fresh air and sunshine, baths and tonic medication.

Figure 2.



Patient stood ventral surface against plate. Lamp placed 24 inches from and centered on 4th lumbar vertebra. Exposure made 10 minutes after introduction bismuth subnitrate suspension.

Figure 3.



Same patient under same conditions as in other figure but exposure made 20 minutes later and after the abdominal support was adjusted.

Symptomatic treatment alone is sure to spell failure and may even aggravate the condition. At best it is unsatisfactory to both patient and physician.

The orthomorphic treatment of viceroptosis is by far the most satisfactory and at the same time the most difficult to have carried out. It is simply the adjustment and the wearing of an apparatus to secure as nearly as possible a return of the abdomen to the archetypal cone.

The majority of the sufferers from this trouble being women, it is essential to consider as far as possible the dictates of fashion and to secure as large a measure of style and shape as is consistent with relief. This desired effect is produced by a corset-form which is practically that suggested by Dr. Gallant in 1903 in a paper entitled "Measuring, fitting and putting on the Corset for Movable Kidney." All bands, straps, buckles, elastics, canvas, perineal cords, unnecessary weight and bulk are eliminated and an extra corset not required. The lines of the figure are much improved or at least maintained. The abdominal support looks exactly like an ordinary corset.

Thirteen years of experiment and experience have convinced me that no ordinary corset maker can or will make this support properly. To be successful the support must be properly and correctly made, fitted and worn—personal supervision is essential.

The measurements taken to make the patterns are circumference at the bust, at the waist, at the anterior superior spines, and at the great trochanters; distance from the waist line to the symphysis pubis, to the iliac crests (right and left), to the anterior superior spines (right and left), to the great trochanters (right and left), and to the desired height of the corset, also the distance between the anterior superior spines. These measurements are taken with the patient in the dorsal position on a firm support with all the clothing removed but the garments over which the apparatus is to be worn, and always and only after the patient has been instructed in taking the position in which the garment is adjusted and in which the ptotic organs float up to as near to the normal planes as possible. The garment is very carefully fitted in both the horizontal and vertical positions before being finished and it is altered after two weeks of wear if unsatisfactory to the patient or physician. Each garment is furnished with two laces of which the lower one is the more important. This is so introduced from above downward as to constrict when tightened the zone lying below a plane passed just above the iliac crests. The garment is adjusted each time it is put on, the wearer assuming a modified Trendelenberg position, the clasps being fastened from the bottom up; the ends of the lower lace are then tightly pulled until the garment feels as snug as can be worn; then and then only is the upright position to be taken, the lace fastened and the upper one adjusted if

required; pads are used if necessary. Patients are instructed to wear the apparatus continuously except when at rest in bed; in some cases a light elastic belt is substituted when resting in the horizontal position.

A cursory examination of the advertising pages of lay and medical journals shows the deep interest taken in splanchnoptosis for therein the number of mechanisms advertised to relieve it is legion. The one adverse criticism applicable to all is that none tend to return the distorted abdomen to the shape of what I have called the archetypal cone and thereby balance the intra-abdominal pressures.

In conclusion let me offer that—

1. Splanchnoptosis is one of the results of a dictum of evolution, the law of variation.
2. Splanchnoptosis is always present when any abdominal organ is found ptotic.
3. Men as well as women are affected but in less proportion, largely due to the absence of accidental causes.
4. Diagnosis of pathological viceroptosis depends upon the finding of ptotic organs accompanied by symptoms.
5. Etiology depends upon the disturbance of the balance of intra-abdominal pressures due to evolutionary tendency, developmental error and accident.
6. Treatment is symptomatic, surgical and orthomorphic. The first is hardly palliative and frequently adds to the pathology, the second at present adds to rather than takes from the pathology, the third meets the greatest number of indications and does not tend to add to the pathology but to correct it.

THE USES OF THERMO-CAUTERY AND RADIUM AS PALLIATIVE MEASURES IN UTERINE CANCER.*

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IN the courteous request of your President to present a paper for this meeting, he was good enough to indicate what its title should be, thereby relieving me of all responsibility of settling so important a question not only, but enabling me to hold him accountable in some good degree for any failure on my part to meet your expectations, even though I use some of the statements and arguments previously employed.

From a paper I published in the *Journal of the American Medical Association*, January 7, 1911—as a Preliminary Report on the mortality of cancer in the United States, as given by the Census of 1910, Bulletin 8, page 20—it appears that cancer is sixth in point of mortality of all

* Read at the Fifth Annual Meeting, Second District Branch Medical Society, State of New York, at Brooklyn, October 26, 1911.

diseases, and that in 1909 its fatalities were 75,000, and that one out of every 1200 die annually of this cause.

In an article appearing in the *NEW YORK STATE JOURNAL OF MEDICINE* for July last, I state that the mortality from cancer from all causes in New York for 1910 was 7500; an increase of 480 over the previous year or 4500 greater per annum in the same area than 25 years ago. The impressive fact of these statistics is seen in its progressive yearly increase, and mortality.

In the statistics first referred to—the mortality from cancer in the United States in 1909, of the female genital organs, was 11,000 and the breasts 7000—and presumably that of women. If this is true the mortality of cancer of the reproductive organs of women is 18,000—one quarter of all deaths from every form of cancer.

Statistics reveal the fact that one in every 14 women die of cancer, and that after the age of 35 it rises to one in 9.

This then is the problem, how best to palliate cases of uterine cancer when the stage for radical operation is past. With these facts in mind, the full significance of its presence, palliation, and treatment stand out in their proper proportions. That my attitude may not be misunderstood in what I have to say, concerning my topic of palliation, I desire to record my profound conviction of the early radical treatment of uterine cancer by excision.

Apart from the malignancy of cancer—the other truth which comes next in importance, is the widespread spirit of unconcern—both in the medical profession and out of it—for early diagnosis. In view of this truth is the added fact—that this delay is the potent cause of failure in its later management in some larger or smaller degree. These things ought not so to be. Lack of early diagnosis and appropriate treatment when discovered, marks the difference between possible cure, and palliation.

Of what, then, in the chronic stage of uterine cancer—does rational treatment consist? I desire to say it does not consist principally in the routine use of the vaginal douche and the administration of anodynes, however useful they may be in its later manifestations. From the surgical standpoint the indications are: First, the removal of all malignant growth compatible with the anatomical relations of the parts.

Second. Attention to all details of cleanliness and antisepsis as will promote healing.

Third. The relief of pain and the proper attention to such supporting measures as are indicated. The *role* the use of corrosive applications has played in cervical cancer is too well appreciated to require more than passing notice. It has a measure of usefulness—no doubt in some cases cures have followed—but the horrible pain it occasions, and the impossibility of limiting its destructive effects leaves no question that other and better methods are known. It is here the value of Thermo-Cautery has demonstrated

its marked superiority. It is not claimed for it, that it is a cure-all, but that it will accomplish more than arsenical paste, caustic potash, and a multitude of escharotics, cannot be gainsayed. The Thermo-Cautery is a potent remedy, and must be applied with tact and skill, otherwise, the vagina is burned or the deeper structures as the bladder, rectum, intestines or important blood vessels. I am prepared to affirm that if the muco-cutaneous vaginal outlet is not burned the pain is usually *nil*. In fact when properly applied to structures within safe reach, there is usually marked diminution of pain—sometimes its disappearance. This is not difficult to understand. Pain in cancer is twofold,—that due first to nerve pressure from the deposit of cancerous structure—and second, that caused by irritating discharges coming in contact with exposed nerve filaments.

The latter fact is scarce appreciated. There have been different views as to the form of Thermo-Cautery most effective.

I have not, however, been able to demonstrate its superiority, but prefer that form of therapy when feasible. Formerly I used the Electro-Cautery exclusively—now usually the Pacquelin method. Portable galvanic batteries are usually difficult to keep in order. When operating in hospitals where such facilities are to be had, nothing farther can be desired. Formerly the platinum wire was used as the principal tool for high cervical amputation, but with proper shaped platinum knives, the amputation is as easily accomplished by the Pacquelin cautery. Experience demonstrates the risk outside of hospital operating, of trusting to a single Pacquelin Cautery outfit. The proper technic of the operation resolves itself into two propositions, the skill and tact not to burn the vagina, and skill and judgment not to injure the structures contiguous to the cervix or uterine body. As to the first proposition, many devices have been adopted. With the patient in Sims position and a Sims Speculum properly held (and this is an art by itself), a perfect view of the field can be had as in no other manner. Common experience proves the difficulty of getting a clear and satisfactory view of a carcinomatous cervix through a cylindrical or bivalve speculum without provoking traumatism and hemorrhage. The Sims is my favorite position of the patient while operating. Vaginal surfaces are usually protected from undue heat by strips of asbestos paper. Sometimes a short, large sized hard rubber speculum can be used with great satisfaction, the patient lying on her back. Tubular metallic specula, with water jackets have been devised, and used with some degree of satisfaction, as a protection from burning the parts, but the field of operation is so imperfectly shown, that used as I have seen it done, without knowledge of what the operator was doing, appears to me as a dangerous expedient. The need of a proper degree of even heat of the

platinum knife is a *sine qua non* of satisfactory amputation of diseased structures. The knife should be of a cherry red; if of too bright a red color, the tissues are disintegrated too rapidly, and troublesome hemorrhage follows. Bleeding is best controlled by adrenalin, acetone, or dilute acetic acid applied with pressure. What is needed, is to cook the tissues thoroughly so that it looks like burned beefsteak. If the uterine body is involved it is possible if the disease is not far advanced, to remove much,—sometimes nearly all, leaving little more than a shell of the peritoneum. The necessity of thorough destruction of malignant growth requires time and patience. When the body of the uterus is attacked, and the organ is movable, downward traction by volsulla aids in the introduction of cautery instruments. After all possible has been accomplished by curved platinum knives, the fundus can be reached by a dome-shaped instrument the termination of which is of platinum. In any event the final application of the cautery should penetrate as nearly to normal structure as is compatible with the anatomical relations of the parts.

Pain and systemic infection in fortunate cases, cease, and if the destruction of malignant structure reaches normal tissue, healing ensues. This relation to possible cure must be appreciated. Healing takes place in proportion as all malignant structures are destroyed. Sometimes the use of the milder caustics as carbolic acid and nitrate of silver promote healing. The thorough application of acetone, which causes but temporary smarting, is useful as a powerful astringent and possesses mild caustic properties.

The efficacy of the Thermo-Cautery is accounted for on a natural hypothesis. It closes the absorbent vessels, and in proportion as this is done systemic infection is relieved. The curability of cervical cancer taken in connection with its etiology by early amputation is not difficult to understand. In its inception it is a local lesion, its principal exciting cause is continued irritation. This condition of irritation is found in the lacerated cervix of the parturient woman. One other truth must not be lost sight of, namely, the influence heat has on the cancer cells beyond the area of destruction of malignant tissue by the cautery. Probably, this is *par excellence* the greatest value of the cautery, it is not irrational to believe, and no other theory accounts for the subsequent improvement of these cases, be it temporary or permanent.

The treatment after Thermic operation is a matter for careful consideration. This will depend upon conception of the attendants, and the consent of the patient. Experience teaches that rational after-treatment of these cases should be based on the same surgical principles as apply to accessible suppurating area of other parts of the anatomy. This proposition if accepted will remove a stumbling block from many minds, and simplify the subsequent management of the

cases. This will consist of daily gentle irrigations of one drachm to two quarts of lysol and filling the ulcerated cavities with soft gauze. The value of the local use of peroxide of hydrogen in these cases is greatly overestimated. If used in sufficient strength to be effective, it is too irritating and likely to provoke hemorrhage, statements to the contrary notwithstanding. Sometimes the temporary use of five per cent. iodoform gauze is admissible, but for a permanent dressing nothing equals soft oxide of zinc gauze. This persistent antiseptic dressing relieves in some measure the pain so often present in malignant ulceration. About 10 years ago a patient suffering from cervical cancer was twice operated on by the cautery and afterwards treated by radium and X-ray; was for a period of 32 months visited by myself or my assistants 700 times. The end amply justified the means. In this case the patient suffered practically no pain in the whole course of the disease. If she had been subjected to abdominal hysterectomy after the second Thermo-Cautery operation when the only evidence of remaining malignant disease was in the stump of the cervix, I believe her recovery would have been complete. I published in the *Journal of the American Medical Association*, December 4, 1909, the following report, showing the efficiency of palliative treatment.

CASE 4.—During March, 1896, a married woman, multipara, aged 42 came under my observation with typical cancer of the cervix, accompanied with extensive involvement. Hemorrhage was violent and the patient was cachectic. She was greatly exsanguinated and very weak. She entered St. John's Hospital in March, and I did a high galvano-cautery amputation as soon as her health permitted. She made a slow but satisfactory recovery as far as the healing and local symptoms were concerned, and after two or three months she was able to resume her family duties. In November of the same year she entered the Bushwick Hospital for extirpation of a large gland of Bartholin. At this time there was no sign of return of the cancerous growth. On June 16, 1897, she re-entered the Bushwick Hospital, being seven months pregnant. The disease had returned, springing up around the old stump. After watching its behavior, I feared, from the hardening and infiltration of the uterine and contiguous structures, labor might induce rupture of the uterus, and on July 18th, at the eighth month of pregnancy, I removed the diseased growth, which encircled the uterine outlet by the Thermo-Cautery. No shock followed and the patient was delivered of a healthy living child on August 6th. Her convalescence from the confinement was satisfactory, as was the healing after the cautery. She enjoyed good health for nearly a year. Then the growth reappeared and she entered the Central Hospital, June 21, 1898, and I removed, by Thermic Cautery, as far as possible the cancerous mass. She returned home August 25th. The healing was not satisfactory and she died a few weeks later from cerebral embolism, which only anticipated the inevitable results of her condition.

I am aware that my proposition to do abdominal hysterectomy which I have practiced for some years following cautery operations varies from established usage, but I am persuaded of its admissibility. Let those who on sentimental or theoretical grounds refuse such procedure, refrain from criticism, until from

actual clinical experience they fail to confirm its utility. Here as elsewhere, the contra indication to abdominal hysterectomy, is the same as that to vaginal hysterectomy, prior to cervical amputation—namely, that of parametric infiltration with or without fixation. Ries' observations on this point are valuable but not always practicable. The risk of immediate fatal septicemia from opening of the intrapelvic malignant structures, is known and appreciated by all operators. The reason I recommend abdominal hysterectomy under these conditions is, that I have never seen a case in which the landmarks were not so lost after high cautery amputation as to make vaginal hysterectomy impracticable if not impossible. While the usefulness of repeated applications of Thermo-Cautery in conditions described is so needful, it is not the only method of treatment to be resorted to. Some recent experiences have been very helpful in the use of radium, conclusion differing from those I had previously arrived at. It may be applied daily or on alternate days. The lower the degree of radio-activity, the longer the time required for its effect. If of high radio-activity one quarter to one half hour is sufficient. If of low radio-activity it had better be continuously applied for six to twelve hours. Its power in such cases to modify the nutrition of the diseased parts and promote healing is undeniable. As compared with the Roetgen ray, for cervical cancer it is far less irritating and the granulation from radium less likely to bleed and the parts heal more kindly. I am from reasons observed, led to the conclusion that the Thermo-Cautery combined with radium has healing power which neither alone possesses.

Mrs. D., aged 73, was referred to me in February last, by Dr. Otis of this city, suffering from cervical cancer. It was spongy, bled easily, and there was an offensive discharge. After the use of the Thermo-Cautery (Pacquelin) in that month, there was improvement and partial healing. The use of radium was commenced March 13th, being used on alternate days, and after July 6th, at intervals of three or four days, the time of application being from one-quarter to one-half hour. Notwithstanding the use of radium, and frequent dressing the growth returned, a slight hemorrhage was present and the patient's health and strength declined. On July 17th I did a second Thermo-Cautery operation, removing all the diseased structure possible, but infiltration behind the cervix, and in front of the rectum, could not without grave risk of opening the bowels be attacked. On August 2d, the use of radium was resumed on alternate days, the period of application being from six to twelve hours, which was continued until September 2d. Immediate improvement began, the discharge and bleeding (which was never large) diminished, and lost its peculiar odor. From September 2d until September 26th, the radium was used with diminished frequency of three or four days, and then discontinued. At this writing, October 5th, the discharge has disappeared, normal mucous membrane covers the entire area, of what was an ulcerated surface. The patient's strength has returned and she appears in normal health. Not to have persisted in this treatment would have allowed the patient to perish. I am not prepared to predict that the growth will not return.

Speaking from so small experience I am led to the conclusion that many cases of uterine cancer pass through a preliminary or early stage of development in which, before pathognomonic symptoms appear, a careful examination would reveal evidence of malignancy sufficiently early to warrant expectation of radical cure by hysterectomy. Such a case has come under my observation within a few months, of a woman from Georgia, suffering from adeno-carcinoma of the uterine body, in a patient whose cervix I repaired twenty years ago. This is a most interesting occurrence—cancer of the body of the uterus after repair of cervix. I desire to refer briefly to some of the drawbacks which are responsible for unfortunate delay in recognizing the presence of uterine cancer.

In a paper I read before the American Association of Obstetricians and Gynecologists at Syracuse in September, 1910, and published in the *American Journal of Obstetrics*, for the convenience of comparison I "divided the medical profession into three classes: First, that great class who make no serious effort at early diagnosis, whose patients drift on to a stage of hopeless interference, and in which no rational effort save the administration of opiates and vaginal douche is made for their relief. Second, a small class who make diagnosis at an early period—not early enough as a rule, for radical operation—who are so convinced that uterine cancer is absolutely or practically incurable that they put their patients in the inoperable list, doing little or nothing in a practical way for their palliation, and they join the helpless throng of unfortunates. Third, the slowly increasing few practitioners who use every endeavor for an early diagnosis, who save some by early operation, who regard no case as necessarily inoperable for palliative purposes, save in the final stages, and who adopt the best recognized methods of palliative treatment."

This is evidence that a sceptical attitude of the medical profession is largely responsible for retarded appreciation by the public—especially suffering women—of what might be accomplished in their behalf. The other discouraging factor is a lack of knowledge among women, of what symptoms should lead them to seek early and authoritative advice at the earliest possible stage of their ailment. These facts make imperative a campaign of education among the profession and the laity, whereby appropriate knowledge shall be disseminated. Most general practitioners when they are in doubt as to diagnosis in grave conditions, medical or surgical, seek the advice of those who by knowledge or experience are able to express an authoritative opinion. When, as already stated, the general practitioner (most cases of uterine cancer usually first seek his advice) sees a suspicious case, he should not hesitate to seek the advice of those familiar with the subject when needful. These are some of the reasons why the rank and file of the medical profession have no adequate conception of what may be accomplished when the stage for radical operation, looking to a cure, has passed. When the opinion has been expressed, that the case is cancerous and inoperable, all efforts for

effective relief are usually abandoned. This word "inoperable" has consigned large numbers of women to much avoidable suffering which ought to have been mitigated, and put them outside the pale of intelligent palliative treatment. In every populous community in New York State, and the United States, there are numbers of women suffering from uterine cancer, who for want of the resources to provide intelligent attention, medical and surgical attendance, and proper nursing, are consigned to want and suffering of which a sympathizing public have no conception. It has been my endeavor for a number of years, as opportunity presents itself to urge on our profession and the laity, a co-operation of effort to such an end. While these efforts have not met with a response hoped for, I see no reason for not continuing them. Preliminary work is always needful, and time is an important factor in its accomplishment. At a meeting of the Medical Society of the State of New York in 1910, I offered a series of resolutions concerning such a plan of education, as already referred to, which the council of the Society in their wisdom laid on the table for reason stated, that other agencies could better accomplish the work of investigation. My resolutions did not call for investigation but a campaign of education. I learned the Council referred to the work of Columbia College, under the George Crocker Special Research Fund, which is investigating the etiology of cancer.

After repeated inquiries of those officially engaged in that work, I learned there was a purpose on the part of those carrying forward these investigations (which I regard as most useful and valuable) to give these results to the medical profession, but my informant questioned the expediency of imparting such information to the laity, only as individual practitioners should do in their professional intercourse with their patients. This raises the question which must be answered now or later, whether the medical profession as represented in the State Medical Society prefer to trust entirely, to exclusive professional channels for disseminating a knowledge of the cause and management of cancer to their own number, or whether in view of its fearful ravages, the public should be made to understand through appropriate channels that the only hope of recovery was in its earliest possible recognition and radical treatment. This work, the promulgation of the truth and value of preventive medicine relating to other diseases (including cancer) as being carried forward by the American Medical Association under the supervision of female members of our profession recognizes not only the right but the duty of the medical profession to disseminate such truths. I indulge the hope that the medical profession of this State through the great and influential agency of its State Society, will yet lend its influence to some wisely directed endeavor for the dissemination of these truths, and that in sub-

sidary societies like this Second Branch, and the many county medical societies, there will come such co-operation as will give the movement an impetus for the relief of these sufferers from cancers as of those holding the public mind in the effort to ameliorate the condition of those suffering from tuberculosis for which millions of dollars are being willingly contributed by a sympathetic public. To this philanthropic end, I ask your hearty co-operation and generous assistance, individually and collectively.

THE TREATMENT OF SURGICAL TUBERCULOSIS.*

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THE subject of surgical tuberculosis has always been one of the most interesting, and at the same time one of the most difficult problems that the surgeon has had to deal with. I shall to-day approach it from the practical standpoint of treatment. In the past the wounds following operations upon tubercular foci were very prone to secondary infection, which, when it did occur, usually led to long standing chronic suppuration, the formation of sinuses, and in the worst cases to pyæmia and lardaceous disease. Acute general miliary tuberculosis was not an uncommon complication following operative treatment upon a tubercular focus. With the advent of antiseptic methods surgical results were very materially improved, but secondary infections and general miliary tuberculosis were still only too often the sequelæ of operative interference. When Koch first introduced his tuberculin it was hailed with delight by the surgical profession throughout the world. There was at that time no method by which the dose of the drug could be estimated. Indiscriminate dosage was the result, and in nearly all cases large doses were the rule. The reactions following the inoculations were marked; the results were unsatisfactory and in many cases disastrous, in fact so much so that the therapy soon fell into disrepute, and was practically discarded by the surgical profession. Although discarded by the surgeons, investigators continued their efforts. Wright and Douglas were able in their vaccine work to demonstrate that the dosage had been too large in former days; they regulated the dose to practical size and reintroduced tuberculin as a safe therapy. After years of trial one may say that in it we have an invaluable aid in our treatment of the surgical forms of the disease.

It is well recognized that a tubercular infec-

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tion, whether it be of medical or of surgical importance, is only possible where the patient's resistance is lowered to the tubercle bacillus. Although it is possible for a patient to be suffering from a well walled off tubercular lesion and yet be in fairly good general health, the reverse is usually the rule, and the patient's general health is much below par. It is on account of this general lowered resistance that the results following operations upon tubercular foci are so problematical.

All the medical lines of treatment are directed to the raising of the lowered resistance to a point, where the body may be better able to take care of the infection. That this can be achieved in the treatment of tuberculosis is demonstrated by the fact that in all of the cases the general health is much improved, and that in a certain percentage of the surgical cases the local disease is cured, or at least arrested, without the aid of operative interference. The raising of the resistance of the patient by every means at our disposal is, therefore, very important, whether the lesion be of medical or of surgical significance.

It is not necessary for me in addressing this Society to discuss the medical methods and measures to be adopted in the raising of the general resistance of the patient; let it suffice to say that every effort should be made to improve the hygiene and diet, and that errors of metabolism and elimination should be corrected. To this general medical care must be added the administration of tuberculin in appropriate doses at appropriate intervals to cause a raising of the resistance to the tubercle bacillus. By these means a cure, or at least an arrest of the local disease may be expected in a large number of the early or incipient cases of surgical tuberculosis without the aid of operative interference. Failing marked improvement in the course of a few weeks the question of operation should be given very careful consideration.

Prior to any operative interference it is wise to estimate the clotting power of the blood, and, if low, administer calcium lactate in order to lessen as much as possible the autoinoculation following the traumatism of the operation. As in other forms of vaccine therapy the first effect of the tuberculin is a depression, in which the resistance is lowered, but this is soon followed by a stimulation in which the resistance is increased. It is wise to remember this fact and perform the operation during the stage of increased resistance, that is about three days after an inoculation.

When the autoinoculation caused by the traumatism of the operation has become reduced to a minimum, inoculations with the tuberculin should be reinstated and continued for at least six months. We find that in patients treated in this manner prior to operation the wounds heal promptly with very little tendency to a secondary infection. Where, however, a secondary infection does occur it responds very quickly to inocu-

lations with appropriate vaccines combined with the usual surgical procedures in the treatment of infected wounds; there is little or no tendency to the formation of sinuses.

The surgical modes of treatment may be discussed under various headings according to the anatomic location of the focus of the infection, viz.:

1. Tuberculosis of the lymphatic glands.
2. Tuberculosis of the spine.
3. Tuberculosis of the bones, other than the spine.
4. Tubercular fistula-in-ano.
5. Tuberculosis of the abdomen.
6. Tuberculosis of the male generative organs.
7. Tuberculosis of the kidneys.
8. Tuberculosis of the bladder.

I. TUBERCULOSIS OF THE LYMPHATIC GLANDS.

Tuberculosis of the lymphatic glands of the thorax and abdomen are practically inaccessible as far as direct surgical interference is concerned and need not interest us in our present discussion, which I shall confine to the glands of the neck, axillæ and groins. The treatment may be divided into classes according to the stage and extent of the disease, viz.:

First. Those cases, in which the glands are small, discrete and not perceptibly matted together.

Second. Those cases, in which the glands are matted together.

Third. Those cases, in which caseation has occurred and progressed to liquefaction.

Fourth. Those cases, in which sinuses have formed.

First. Where the glands are small, discrete and not perceptibly matted together the disease is confined to the gland tissue and it may be regarded as in its incipient stage. Treatment directed to the raising of the resistance of the patient generally suffices to effect a cure, or at least an arrest of the infection. An investigation should be made in the neighboring regions for sources of irritation or of fresh infection; if there be any found they should receive prompt attention.

Second. Where the glands are matted together we have in addition to the adenitis, a peradenitis, and the process is usually too extensive to be cured without the aid of surgical interference. The operation, however, should be deferred until the patient's resistance has been raised by the methods already described. During the operation care should be taken to minimize the operative traumatism, and we prefer to do a clean dissection by a sharp knife, rather than by blunt dissection. Drainage is dispensed with where possible, to lessen the risk of the occurrence of a secondary infection; where necessary on account of the oozing, it should be only temporary, not lasting more than 24 hours. The

wounds usually heal by first intention; where, however, a secondary infection does occur, cultures must be taken, a special vaccine prepared and administered. The wound must be opened to the full extent of the infection, cleansed and packed with iodoform gauze; the wound will then heal quickly by granulation tissue without the formation of sinuses.

Third. Where caseation has occurred and progressed to liquefaction operation is inevitable, but it should be deferred as long as possible in order to enable us to raise the resistance of the patient as high as possible by the administration of tuberculin, etc. The glands should be kept under constant observation to forestall by aspiration any progressive softening. Where aspiration is necessary it may be followed with great advantage to the local disease by the injection of Murphy's formalin in glycerine solution or Beck's bismuth-vaseline paste. Cultures should be taken from the fluid aspirated to ascertain whether a mixed infection has occurred or not. If it has occurred a suitable vaccine should be prepared and administered in addition to the inoculations with the tuberculin. If we can by these means control the process of breaking down until we have the patient and the glands in a favorable condition for operation, we do so. But if the process be progressive in spite of these means, early operation is imperative. In the operation the glands and cicatricial tissue should be cleanly dissected out. If the cultures taken prior to the operation show that a mixed infection has not occurred, the wound may be closed without drainage, or at most only temporary drainage for 24 hours. If the cultures show that a mixed infection has occurred, or if during the operation the wound has become extensively soiled by the rupture of gland abscesses it is wise to treat the case as a septic one and provide for ample drainage.

Fourth. Where sinuses have formed as the sequelæ either of a ruptured gland abscess, or of an operation, a secondary infection has invariably taken place, and the sinuses are lined by thick pyogenic membranes. Smears and cultures should always be taken to determine the secondary infection, appropriate vaccines prepared and administered in addition to the other means for the raising of the resistance of the patient. The clotting power of the blood should be estimated; if high it should be lowered by the administration of citric acid, in order that the serum of the patient may have better access to the focus of the disease. Beck's paste is here valuable not only as a therapeutic agent, but also when used in conjunction with the X-rays as a diagnostic agent in the outlining of the course of the sinuses and their ramifications. Failing marked improvement in the course of a few weeks it is usually necessary to thoroughly curette away the thick pyogenic lining membrane of the sinuses, in order that the vaccines may have better access to the seat of the trouble.

In those cases in which the glands have not been removed at a prior operation, it will probably be necessary to do so by an open dissection at a later date.

2. TUBERCULOSIS OF THE SPINE.

In tuberculosis of the spine the foci in the vertebræ are inaccessible as far as direct surgical interference is concerned, and it is only late in the history of the case where an abscess has formed and tracked to the surface at some remote situation that the question of operation arises. Early in the history of the case immobilization of the spine by appropriate orthopedic measures, and the raising of the resistance of the patient give most gratifying results. Later on when an abscess has formed and tracked to the surface, the treatment should be identical for several months until the patient's resistance has been raised, when the question of operation is in order. The abscess should then be aspirated with the strictest aseptic precautions, and injected with Murphy's formalin in glycerine solution, iodoform in olive oil or Beck's bismuth-vaseline paste; this should be repeated when necessary. Where a secondary infection has not occurred, and does not occur, an arrest of the disease may be expected, but the treatment should be continued over a long period of time even in spite of apparent arrest. Where, however, clinical signs and cultures show that a secondary infection has occurred a special vaccine should be prepared and administered in addition to our other treatment; it may be necessary in addition to thoroughly curette away the thick pyogenic lining membrane and provide for ample drainage. Where sinuses have formed they may be treated along the lines already described under the treatment of the lymphatic gland sinuses.

3. TUBERCULOSIS OF BONES, OTHER THAN THE SPINE.

The treatment of tuberculosis of the bones other than the spine may be discussed under two headings:

A. Those cases in which a joint is involved.
B. Those cases in which a joint is not involved.

A. Those cases in which a joint is involved: In the early or incipient cases immobilization of the affected joint combined with means for the raising of the resistance of the patient give most excellent results. The treatment should, however, be prolonged over a considerable period of time even in spite of apparent arrest of the infection. Where necrosis has occurred the same treatment applies until the resistance of the patient has been raised, when operation is called for. At the operation the joint should be freely opened and all necrotic tissue removed. The wound, if a secondary infection has not already taken place, should be closed without drainage.

or at most only temporary drainage. Following the operation the preliminary orthopedic measures, etc. should be continued. Where casts are employed windows large enough for wound inspection are indispensable. Secondary infection should not occur; where it does occur the wound should be freely opened and treated along the lines already laid down for the treatment of infected wounds. Where sinuses have formed either as the result of a ruptured abscess or as the result of an operation, they should be treated along the lines already discussed for the treatment of sinuses occurring elsewhere.

B. Those cases in which a joint is not involved: Early in the history of the case where necrosis has not occurred surgical rest to the affected bone, if possible, combined with means for the raising of the resistance of the patient are indicated. Later in the history of the case where necrosis has occurred these measures should be followed in the course of a few weeks by operation. The bone should be opened to the full extent of the disease, care being taken to preserve the periosteum for future use. The necrotic area of bone should be carefully removed by gouge and chisel. The cavity should be allowed to fill with blood clot or be filled with Beck's bismuth-vaseline paste or some similar substance, the periosteum brought together and the wound closed without drainage. Primary union is to be expected, but where a secondary infection occurs it must be treated along the lines already described for wound infection occurring in other regions.

4. TUBERCULAR FISTULA-IN-ANO.

Without entering into the question of the ætiology, pathology or diagnosis of tubercular fistula-in-ano I may be permitted to state that fistula-in-ano is due to tuberculosis far more frequently than we once supposed. It is commonly found in patients suffering from advanced tuberculosis in other parts of the body, and it is then simply a part of the main disease. Very often, however, it is of tubercular origin without the fact being suspected; those cases are very prone to recurrence after operation, and occasionally the operation is followed by an acute general miliary tuberculosis. I consider it wise to regard the case as of tubercular origin where recurrence of the fistula has followed an operation by a competent surgeon, even where the diagnosis of such cannot be established. In the treatment of tubercular fistula-in-ano operation is called for, unless absolutely contra-indicated by the extent of co-existing disease in other parts of the body. Before the operation is performed, however, every effort should be made to raise the resistance of the patient by the methods already described. Following such a line of preliminary treatment convalescence from the operation will be rapid, and recurrence of the fistula will be rare.

5. TUBERCULOSIS OF THE ABDOMEN.

In the treatment of abdominal tuberculosis every effort should be made to attain a raised resistance of the patient before considering the question of operation. Failing marked improvement in the course of a few weeks the abdomen should be opened and treated according to the conditions found. If a general infection of the peritoneum be discovered, thorough lavage with salt solution followed by careful closure of the wound will generally suffice. If, however, a tubercular appendix, cæcum, ovary or tube be found it should be removed. It is surprising how extensive an operation may be performed upon a patient suffering from abdominal tuberculosis and be followed by a rapid recovery of the patient; especially is this true where the operation has been preceded by a preliminary line of treatment for the raising of the resistance of the patient. It is the experience of most surgeons that occasionally the tubercular nature of the abdominal disease is not suspected prior to the opening of the abdomen. In such cases it is advisable to institute treatment for the raising of the resistance as soon as the patient has recovered from the autoinoculation caused by the traumatism of the operation.

6. TUBERCULOSIS OF THE MALE GENERATIVE ORGANS.

Without entering into the ætiology or pathology of the subject I may be permitted to say that in these organs the disease most commonly makes its first appearance in the epididymis, from which the body of the testicle, vas deferens, vesiculæ seminales and prostate are infected by direct extension. Early in the history of the case, where the disease may be regarded as in its incipient stage and confined generally to the epididymis, the raising of the resistance of the patient and the suspension of the organ may suffice to effect a cure, or at least an arrest of the disease. Where the condition has progressed to caseation and softening it is necessary to operate, but the operation should be deferred as long as possible to enable us to raise the resistance of the patient by the administration of tuberculin, etc. The patient should be kept under constant observation to instantly forestall by aspiration any progressive softening and rupture of the abscess with the risk of the occurrence of a secondary infection. Where aspiration is necessary it may be followed by the injection of Murphy's formalin in glycerine solution or Beck's bismuth-vaseline paste. Failing marked improvement in the course of a few weeks, operation should not be further delayed. It has long been recognized that in surgical tuberculosis if the greater part of the disease be removed, the remaining part is favorably influenced, and especially is this true where the resistance of the patient has been raised prior to the operation. In tuberculosis of the male gen-

erative organs where the disease has spread to the prostate and seminal vesicles, removal of the testicle and accessible vas deferens is generally followed by very marked improvement in those organs. In operating upon these cases it is advisable, for at least psychic reasons, to preserve the body of the testicle whenever possible; this is usually possible if the case be seen early. The inguinal canal should be opened and the vas deferens removed up to the level of the internal abdominal ring, care being taken to cauterize the stump. McArthur advises that iodoform in olive oil be injected into the seminal vesicles through the opened vas deferens, where the disease has already spread into that organ. It is seldom advisable to consider the question of the removal of the prostate or seminal vesicles not only on account of the severity of the operation, but also for the reasons given above. If an abscess forms in the vesicles it may be necessary to open it through the perinæum. The treatment of the wounds following operations in these cases in regards to drainage, secondary infection, etc., is identical with that already described in detail in the treatment of the wounds following operations upon tubercular lymphatic glands. Where sinuses have formed, either as the result of a ruptured abscess, or as a sequela of an operation, a secondary infection is invariably present; the treatment is the same as that already described for sinuses occurring elsewhere. Where sinuses have formed it is usually not advisable to attempt to save the body of the testicle; it and the accessible vas deferens should be removed as soon as the patient's general and local condition permits.

7. TUBERCULOSIS OF THE KIDNEYS.

In renal tuberculosis the symptoms referable to the kidneys are usually not recognized until the disease has progressed beyond the incipient stage. In unilateral renal tuberculosis the patient's resistance should be raised by the methods already described, but nephrectomy should not be delayed too long if cure is to be obtained. Tuberculosis elsewhere, even if it be a small focus in the opposite kidney, need not be a contraindication to operation, provided that the opposite kidney is carrying on its function in a satisfactory manner. In removing the kidney the stump should be cauterized, in order to lessen the risk of wound infection. If a secondary infection does occur it should be treated along the lines already discussed under the treatment of wound infection in other regions. The same may be said in regards to the question of sinuses.

8. TUBERCULOSIS OF THE BLADDER.

In tuberculosis of the bladder the disease is secondary to tuberculosis of the male generative organs or of the kidneys. It is generally very materially improved following operations for the relief of the exciting focus. It is seldom advis-

able to consider operative interference, except late in the history of the case, when it may be necessary to drain the bladder as a palliative measure. Raising of the resistance of the patient, removal of the exciting focus, bladder lavage followed by injections of iodoform in olive oil give us our best results.

GENERAL CONSIDERATIONS IN THE TREATMENT OF SURGICAL TUBERCULOSIS WITH TUBERCULIN.*

By NORMAN K. MACLEOD, M.D.,

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MR. PRESIDENT AND GENTLEMEN:

AS the practical surgical aspect of infections with the tubercle bacillus is to be dealt with by Dr. Lothrop and my brother, it is my intention, in this discussion, to limit myself to the general considerations which govern, not only the administration of tuberculin, but also, to a large extent, the surgical procedures to be instituted, no matter in what part of the body the disease may be encountered.

As we all know the tubercle bacillus, in itself, and in the disease it produces, has proved itself one of the most resistant and mystifying organisms that the bacteriologist and the investigator in the field of immunity have encountered. And hardly, if any less confusing, is the amount of literature which has been placed before the profession during the last few years. It would appear that nothing is too small, or too far distant from the main mass of definite knowledge, to attract the investigator in this interesting field of pathology. "Grasping at straws" would seem to properly characterize the greater amount of investigation, the fruits of which have been so constantly set before us.

It is true that our information about the disease is far greater than it was a few years ago, that our treatment is far better, and that our ultimate results are in accord with this increased knowledge and improved treatment.

But these results have been obtained not so much by our conquest of the tuberculous field, but, rather, by a greater knowledge of the general forces of immunity, as they are applied in defence against the whole bacterial world.

The supreme difficulty, encountered in investigation, has been the inability to obtain the true toxin of the organism. It is thought that only under the conditions which exist in body defence against attacks by the bacillus, does the bacillus elaborate its true toxin; and further, it is thought that in bacillary attack the toxin is produced only by interaction between the bacillus and the leu-

* Read at the Seventh District Branch of the Medical Society of the State of New York, at Rochester, October 19, 1911.

cocytes, or allied cells, such as obtain around a tuberculous focus or in lymphatic glands.

Marmorek, with this view under consideration brought forward his serum by growing bacilli in a leucotoxic serum. With this preparation he inoculated horses. The initial serum, he claimed, contained the true toxin of the tubercle bacillus produced under conditions simulating the production of toxin, as it exists within the human body. The final serum from the horse contained the defensive antibodies, antitoxic to the toxin in the initial serum. Marmorek and others working along different sera lines, have claimed certain results for their method, but it is doubtful, however, if the clinical results differ in any way from the results obtained by hygienic care combined with appropriate therapy.

Organotherapy, hemotherapy, drugs of many kinds, leucocytic stimulants have all been tried, have been much vaunted, but in the end have proved practically worthless from a specific standpoint. Tuberculin, however, after many years of the most careful consideration by pathologist and clinician, has attained a place of proved value. The clinical results obtained, by its exhibition, have justified its discoverer to a certain extent in his original contentions, and have proved of immeasurable value in the treatment of the disease.

It is true we do not know absolutely whether tuberculin is the true toxin or not of the tubercle bacillus, or whether the response within the body, upon its administration, is an antitoxic one directly or indirectly.

In view of these doubts theory alone can be resorted to in the effort to explain the action of tuberculin, or body reaction in relieving itself from the infection.

In recovery from the disease the focus is walled off and practically put outside the body, in so far as its influence upon the body is concerned. Further, that tuberculin stimulates this walling-off process. It is also known that following every dose of tuberculin, no matter how small, there is a reaction about the infected focus, and that with the larger doses marked general reactions manifesting themselves by temperature, malaise, even by chills, may occur. It is not believed that these manifestations are due directly to tuberculin but indirectly. The tuberculin, in some way, stimulates the cells about the infected focus to relieve themselves of partially digested tubercle bacilli and their products. These products are believed to be the true toxin of the tubercle bacillus and being so cause signs of toxæmia. The relief to the cells of these products brings about a change for the better, in that they are again in a position to take up their defensive properties; and lastly the restoration of more healthy conditions about the lesion, and the casting out of small doses of toxin may prove the stimulation necessary for a quicker and more stable formation of connective tissue.

Again, in tuberculosis the intoxication is so

slow that the mass of the body cells may not be sufficiently stimulated, at any one time, to respond with antibodies against the intoxication. In tuberculin treatment a large stimulation given suddenly rectifies this condition, and an antituberculin response follows. The cells, free from this chronic poisoning, exert their antibacterial functions with relief of the condition.

Whether the resistance offered to infection by the tubercle bacillus is local, or general, is difficult to solve. We know perfectly well that either one, or both, these conditions may obtain in infections other than that with the tubercle bacillus. In erysipelas, for instance, there can be no doubt that either a local or a general resistance may be in action against the streptococcus invading. How often have we seen a facial erysipelas cease to extend, and practically clear up, in twenty-four hours, the temperature and pulse becoming normal, the patient feeling well, the only symptom remaining being the rash. On the other hand, frequently cases are seen in which the disease terminates by a local rise of resistance, that is, a local resistance being developed in one part of a lesion, which clears up, while the other parts extend. The whole process finally comes to an end due to some anatomical condition. In tuberculosis it is evident there is a definite local resistance resident in the tissue, since healing and extension of a lesion, such as lupus, frequently proceed synchronously. In other lesions it is not difficult to demonstrate by sections that the same conditions exist as in lupus.

But on the other hand, Bulloch asserts, that X-ray treatment of lupus is more beneficial, if accompanied by a high opsonic index than with a low one; one of the effects of X-ray treatment is to permeate the focus with plasma, so evidently a more marked improvement obtained by a plasma with a high opsonic content, over that with a low one is some indication of a general resistance.

Emery believes that resistance to tuberculosis is mainly local inherent in all the tissues, but that there also exists a general resistance, which, however, does not possess the same value as does the former. This seems to be the true explanation.

In the foregoing discussion I have but endeavored to place briefly before you the place that immunity to tuberculosis occupies in the eyes of the medical profession of to-day.

From the practical standpoint there can be no question, that of all forms of treatment from the specific point of view, tuberculin occupies the pre-eminent position. There can be no doubt, that in properly selected cases, tuberculin administration is followed, in a large percentage of cases, by definite benefit to the patients. I use the term "benefit" and not "cure" advisedly. From a clinical standpoint it does not materially matter, whether a patient is free from live tubercle bacilli provided that all signs of toxæmia and progression of the focus lodging the organism cease, and that this condition of cessation is a permanent

one. I raise this point now, but will refer to it later, for this reason, that I believe tuberculin helps the isolation of organisms, but does not destroy them entirely, and that in benefiting the patient it does so to this extent only. I do not believe that the majority of cases pronounced cured, are cured to the extent of entire relief from infecting organisms, but that only the condition of clinical cure above obtains. Yet this is sufficient for practical purposes since a person once infected and pronounced cured enjoys a high degree of immunity, against subsequent attacks of the disease in other parts of the body. Yet the fact must not be lost sight of, nor must the physician neglect to impress upon the patient, that there are many influences acting to lower this immunity which is enjoyed, and that a drop of resistance, beyond a certain point, may bring about a recurrence of the disease in its original site. One other point in this connection arises: It is believed that in any infection with any kind of organism, the virulence of the organism rises immediately upon encountering the resistance, which the body offers to its progression. This must be so in many instances. When tubercle bacilli are incarcerated by fibrous tissue, they probably, in time, lose considerable of their virulence. The resistance offered to their lowered activity is in part passive, in part active. Let, however, the resistance of the body fall to any marked extent, then the active part of the resistance offered to the bacillus becomes such, that the bacillus, comparatively speaking, regains some of its virulence. As an end result of this the organism may take on a true virulence instead of a comparative one. This, of course, is accompanied with an active focus of disease.

Our treatment, in all cases of surgical tuberculosis, must have as its ultimate aim—

I. The creation of a stable condition in and around the infected focus.

II. The removal of the focus in its entirety where this is possible. Any tuberculous focus, in any way active, is in an unstable condition—that is, it is very sensitive to the conditions which govern the general immunity of the body; any condition unfavorable to the body may swing the balance of power in the direction of the attacking bacillus; conversely any favoring influence may assist the body to a victory. As we have mentioned previously, tuberculin, by relieving the cells of their load of poisonous material, by restoring to them their former activity and by hastening the formation of fibrous tissue, seems to be the rational therapy. In addition the constant flushing of the part with blood consequent upon the inoculation acts farther in the promotion of healthy conditions. When tuberculin was first introduced Koch believed that cure was effected by the sloughing away of the diseased area. This erroneous view was the cause for the great doses and the great reactions which obtained in the early days of the therapy. It was largely Wright's work which rehabilitated tuber-

culin in the eyes of the profession and brought to us our present beliefs. Wright was able to demonstrate that opsonic response was possible with greatly reduced doses. He showed that after tuberculin administration there first appears an opsonic depression, during which time the production of opsonins is diminished. Following this depression the true stimulative results appear and the opsonic bodies are materially increased. The larger the dose of tuberculin the more pronounced is the sequence of events. As Wright believed the depression, or negative phase period to be harmful, he conceived and instituted the practice of small dosage frequently repeated, and controlled by the opsonic index. The object of this form of dosage is to gently stimulate the local focus, to increase the blood supply to it, and to maintain the production of opsonins at a level slightly higher than that which obtains in a normal individual. Whether opsonins have a direct curative value or not is of no moment in this discussion. It is sufficient that they are some index of the capability of the patient to respond to stimulation, and that they are also a measure of the patient's whole defensive mechanism. The small dose plays then this important part: By virtue of its mild stimulative powers it favors the production of fibrous tissue about the lesion. If continued over a period of time it will produce sufficient of this tissue to practically isolate the lesion from any of those disturbing factors, by which the body was formerly able to influence it. That is, a stable condition has been obtained, and obtained without any marked disturbance in the lesion. Closely related to the production of the stable condition is the question of the removal of the entire tuberculous focus where this is possible. Formerly it was the custom to remove, for instance, tuberculous glands of the neck, whenever they might be encountered. The state of the lesion was of little importance, the whole thought was to get the glands out. This was good practice when the infection was confined to the glands, and when all the glands could be detected and removed. But, unfortunately, in an active lesion it is a difficult matter to detect all the glands, and even more difficult to say whether or not the periglandular tissue is affected. To remove a gland with a periadenitis about it, is, in the majority of cases, fruitless labor. To say that in the removal of the major part of a tuberculous mass, the minor part, in all probability, will get well, is but to shelve the question. How many times have we seen numerous scars upon a neck the result of operation after operation for recurring glands. The point is this that although the removal of tuberculous material is of high importance, yet it is unwise to remove it unless the whole mass can be taken away. In this respect I am referring to early discrete glandular involvement of the neck. In glands of the neck there should be but one operation, and the whole

treatment should be aimed at its successful accomplishment. If it fails masses of fibrous tissue will be found at the subsequent operations with glands hopelessly involved in it, and also the subsequent operations in all probability will not be for the removal of discrete, but for caseous and broken down glands. With appropriate care it is possible to prevent breaking down, even in fairly large glands, for long periods of time. During this time the general health can be improved, the infected area put into a stable condition, and eventually removed without fear of recurrences.

Of course in cases where there are large amounts of tuberculous material forming and breaking down nothing else is indicated except immediate removal followed by the exhibition of tuberculin.

Formerly we believed that after a focus was entirely walled-off and there was cessation of symptoms for several months the case might be pronounced cured. This may be so in some instances but in others the lesion is simply quiescent, the organisms still being present but not effective. We have seen cases where recurrence has taken place even after thirty years; and we have administered tuberculin in some cases for a year after the cessation of all symptoms and have had recurrences. In the light of these experiences we now inoculate for a proper period of time, and then attempt, whenever feasible, the removal of the entire tuberculous area. This procedure, as far as we are able to judge at the present time, has been accompanied by most excellent results.

Having defined, to a small extent, the principles which govern the administration of tuberculin and the objects to be achieved, it might not be out of place to discuss briefly a few of the conditions essential to the successful treatment of the disease.

Tuberculin, like all other powerful stimulants, demands that body cells be in a fit state to respond to strong stimulation; if they be not in this condition then stimulation, such as tuberculin gives, will be followed only by evil results. In other words, opsonic production will be of such a character that the negative phase will be extremely well marked without a positive phase of compensating value.

This, then, is essential—that the patient must not be in such physical condition, nor in a state of such profound toxæmia that the cells are unfit to respond to the stimulative power of tuberculin.

SITE OF THE LESION.

Every case of surgical tuberculosis is a law to itself. No definite rule can be laid down to guide one absolutely in its treatment. The dose that applies to one case may, in no way, be tolerated in another case similar, clinically, in appearance. Bearing this in mind all sites are practically equal with two exceptions:

1. As we are all aware certain tissues are more prone, during inflammatory reaction, to break down than others. This is particularly true of the epididymes. This being so, tuberculin must be employed with the greatest care in infections of these organs. We have seen cases break down with astonishing rapidity under a dose increased with too little consideration.

2. In consideration of the anatomical structure of the kidney it is, theoretically possible, to induce by tuberculin a condition of uræmia. As we have observed previously tuberculin induces a condition of hyperæmia about the lesion, if this should be carried too far by large dosage. It is conceivable that sudden pressure in a capsulated and sensitive organ, such as the kidney, might be followed by serious consequences. Personally we have never observed this unfortunate condition, but the fact that it is possible must be carried in mind.

CONDITION OF THE LESION.

Early lesions usually show with small dosage better results than with large dosage. It may be said that the earlier the lesion the smaller the initial dose, the older the lesion the larger the initial dose. This follows our experience with tuberculin itself, that is, that some cases under extremely small doses of tuberculin become sensitized, in some way, so that they are never able to bear subsequently, without marked reaction, a dose they formerly could be given with impunity.

LESION WITH SINUS FORMATION.

In all lesions with sinus formation care must be taken to see that proper drainage is afforded, and that serum is being drawn through the wall of the sinus. Granulation tissue should be scraped away and iodine or a citrate solution applied. The discharge should be carefully studied and in mixed infections appropriate specific vaccine should be prepared and administered.

Finally in this connection let me emphasize here that lesions, with a long continued sinus, should be carefully searched for foreign bodies. In our experience we have seen several cases in which this condition has obtained.

AUTOINOCULATION.

Any active lesion which is not enjoying surgical rest gives off, as the result of increased activity, toxins. These toxins, being absorbed, bring about results identical with those which follow tuberculin administration. It is a simple matter to demonstrate that the opsonic content of the blood is increased after exercise in pulmonary tuberculosis, and in surgical tuberculosis of a joint. Properly graduated exercise of a lesion is an excellent thing under certain conditions, but indiscriminate exercise is fatal to the safety of that lesion. An initial appropriate dose of tuberculin brings about a slight negative phase

with a corresponding positive phase following; the second dose aims at precisely the same thing, but it aims to produce it at a definite time, that is at a time when the positive phase is just beginning to decline. In indiscriminate exercise the dose of toxin may be given off at any time, negative phase may be heaped upon negative phase, in fact any sequence of events may obtain. To this state of affairs the term autoinoculation is applied. It is observed not only in tuberculosis but in many other conditions.

Before instituting tuberculin treatment one must make sure that autoinoculation is reduced to a minimum otherwise judgment in tuberculin dosage must be absolutely at fault. Rest to the part usually accomplishes this and should be insisted upon.

In this rather jumbled up discussion of mine I have not endeavored to follow any definite sequence of events but have rather ambled into side paths as they have presented themselves to me. The field is such a vast one that the futility of attempting any logical or coherent condensation of it must be apparent. I have not, in any way, offered any set rules to govern one in his choice of tuberculin or the dose to be given. Each case is a study in itself and the dose must be considered from that standpoint. For ourselves we use bacillus emulsion entirely, not because it possesses any advantage over other preparations, but simply because we are more familiar with it. We also employ the mixed bovine and human strains of the tubercle bacillus as recommended by Allen and because we seem to have had superior results with the combination as compared with either alone.

In regard to the initial dose—the smaller this is the better. There may be haste required in treatment of a tuberculous focus, but there can be no question that haste in tuberculin administration is absolutely contraindicated. After the initial dose the increase of dosage should be small. Reactions should be avoided. As in vaccine therapy any dose, no matter how small, which brings about a successful result is the dose to be employed.

Every surgical case of tuberculosis should be treated precisely as pulmonary tuberculosis is treated. It may not be necessary to send the patient away to other climates but the fresh air of home should be utilized to the utmost. Medical aid ranks equally with surgical and immunity procedures.

In conclusion I would like to say that we have every confidence in tuberculin and the vaccines in properly selected cases. Our results have been uniform and satisfactory. We believe that the results we have obtained are not due to tuberculin alone, to surgery alone or to medicine alone, but to a combination of these three.

In early operable lesions with prophylactic inoculations the surgical results have been more than satisfactory, the wounds have closed by first intention and recurrences have been the marked

exception. In later cases, with or without sinus formation, the results have justified the tedious routine of medicine, surgery, tuberculin and the vaccines. We have had disappointing failures, too many of them, but the day is not far distant when we may look back upon those failures and say to ourselves with regret, "If we but had them now."

Tuberculosis is one of the most chronic of diseases, the combat between itself and the defensive mechanism of the body is almost equal. Many cases recover, even advanced cases, without other specific aid than that which the body itself provides. Research or the proof of any contention is slow. Tuberculin itself took years before it demonstrated its usefulness.

As we look back into the past and view the many claims of specificity for procedures that though promising much but yielded little, as we view the immense amount of investigation that has proved, in the main, so fruitless we must pause in wonder that an organism so well known should be able to resist these never-ending attacks brought to bear upon it. That much has been accomplished, that the triumph of artificially produced body immunity is assured there can be but little question.

But where this ultimate benefit will come from we do not know, can hardly guess. Yet this we do know that, everything else failing, the body itself will build its own complete immunity against this foe, as it has done before against others.

REVIEW OF THE RECENT WORK ON THE USE OF NORMAL SERUM IN HEMORRHAGE.*

By E. B. PROBASCO, M.D.,

GLENS FALLS, N. Y.

YOU are all familiar, by experience or otherwise, with the use of the various sera, both as a prophylactic and a curative treatment of many diseases. A great step forward was accomplished when the serum treatment was introduced into therapeutics. The results in many instances have been nothing short of remarkable. It has offered a solution to many problems, and opened the way to the cure of onetime impregnable diseases, and points a significant finger into the future of medicine. I wish to call your attention to some recent work along the line of prophylaxis and treatment of hemorrhage by the use of serum, especially human blood serum. The subject offers intense interest and almost startling possibilities for the future treatment of this most dangerous condition. Since Harvey's

* Read at the annual meeting of the Medical Society, County of Warren, at Glens Falls, October 11, 1911.

discovery of the circulation of the blood, the medical profession at times has had great hopes of finding in the transfer of the blood from some healthy source to individuals suffering disease a means of curing many otherwise refractory or incurable maladies. About the middle of the seventeenth century lamb's blood was transfused into the human subject, but it was soon learned that the operation was unsafe inasmuch as death frequently followed, in consequence of which the practice was discontinued. Many years later direct transfusion was attempted from one individual to another by means of a canula, but because of coagulation, thrombosis, etc., the method was abandoned. Defibrinated blood has been injected intravenously, but the method is beset with danger and is no longer considered safe. Crile has given us our most recent method of transfusion, and from a surgical standpoint it must be considered an ideal one. However, even here we meet with sad experiences. It is well known that sudden death sometimes follows the transfer of blood in this way. In these cases air embolism can be excluded, and we have left as theories, red-cell embolism, hemolysis (or dissolving of the red cells) and thrombosis. Hopkins has demonstrated intravascular phagocytosis—polynuclear leucocytes ingesting as many as five or six red cells. This phenomenon suggests the speculation whether in the transfer of whole blood to one individual from another, the cellular elements are not just so much foreign material which the recipient must destroy and dispose of, and whether the main virtue does not lie in the serum alone. However, experience still teaches that in cases of exsanguination and anæmia transfusion of whole blood is the method of choice. In a study of cases in which animal sera was administered to human beings, it was noted that certain symptoms appear regularly and in sequence. First, the fever, which is high and varies several degrees. It is irregular and fluctuates with the amount of serum used. It is the last symptom, as well, to disappear. Then appear certain rashes—urticaria with œdema and itching; erythema follows. Sometimes scarlatiniform or morbiliform rashes appear. The lymph nodes enlarge, joints may become swollen and painful, there may be a general œdema and albuminuria with casts; rarely hemorrhages into the bowel or urethra; œdema of the glottis and bronchitis. We hear of sudden death following the administration of a single dose of antitoxin (animal serum). Some of these cases are reported but many are probably not, but altogether they detract a mere fraction from the splendid record of antitoxin. von Pirquet and Schick first considered these symptoms and found them in twenty per cent. of cases receiving antitoxin. They found the incubation period to be from eight to twelve days, and they called it "serum sickness." The frequency of serum sickness depends upon the amount of serum used, and since the use of con-

centrated sera, amounts to only about six-tenths of one per cent. von Pirquet and Schick demonstrated that a second dose of serum within at least ten days produced a more rapid and severe sickness than the first. Richet had shown this with his experiments with "congestin," and demonstrated that the first dose produced a sensitizing effect—a hypersensibility, and is a condition the opposite of prophylaxis, and he called it "anaphylaxis." Roseau and Anderson, in their experimental work on anaphylaxis, have shown conclusively that the danger of anaphylaxis exists only when humankind or animal is treated with an alien serum; that from one of its own species being innocuous. They experimented on many species of animals. This effect of serum has been shown to be independent of the antitoxin content as normal sera causes anaphylaxis or severe symptoms and sometimes death as well. Antitoxin is said to have caused in New York City one death in twenty-five thousand injections. These considerations—the dangers of anaphylaxis—have led to the partial abandonment of the use of horse or other serum in the treatment of hemorrhage save when there is urgency, in which case any commercial product may be used. Normal human serum is without danger, and may be used liberally. P. Emile Wile has been credited with having introduced the treatment of hemophilia with serum injections. He undoubtedly gave impetus to this method, but before him Dr. Albert Frey, of Newark, published a paper dealing with the treatment of three brothers, hemophiliacs, with serum injections. He got his suggestion from Feltz and Pigot, who treated purpura this way, and suggested it in hemophilia. Hayem in 1882 experimented with natural and artificial sera to determine their effect on coagulation of the blood. Wile extended Hayem's work and found that injection of fresh sera from man, rabbits and horses was equally efficacious in stopping pathologic hemorrhage. He used 15 c.c. intravenously or 30 c.c. subcutaneously. He found also that old sera was not efficacious, and should be no more than fifteen hours old to get full therapeutic results. While he found sera from cattle to be active, he also found that it was the only one which caused accidents—anaphylaxis and sudden death occasionally. The conclusions of Wile's work were: The blood serum of horses, rabbits and cattle as well as human serum, has the power of controlling hemorrhagic processes by increasing the coagulability of the blood—that beef serum was too toxic for ordinary use—that serum should be less than two weeks old and that the doses should be 15 c.c. intravenously or 30 c.c. subcutaneously. Also that the local application of serum to the point of hemorrhage favored clotting, and that the increased coagulability of the blood persisted for a period of from fifteen days to several weeks. His studies of hemophilia satisfied him that in the hereditary type of the disease the results

were but temporary—repeated injections were necessary to control the bleeding—that the massive type of visceral hemorrhage was controlled but imperfectly—and that the greatest value of the treatment lay in the prophylactic injection of serum before operative procedures were practiced. In sporadic hemophilia and acute purpura, on the other hand, the results were permanent. In chronic purpura and pernicious anæmia the effect was only transitory. While normal human serum is the product of choice, commercial specific animal sera on the market have frequently been resorted to in emergency, wholly disregarding the dangers of anaphylaxis. De-jardin of Belgium advised that antidiphtheritic serum be used when there is urgency. Dr. Lommel tells of an epistaxis in a boy of four which resisted all measures, and was checked by injections of 20 c.c. of streptococcus serum. Later on, return of the epistaxis was relieved by local application of the serum. Ricard and Micleon tell of a successful treatment of hemotomata by injection of and local tamponade of, diphtheritic antitoxin. Wirth used it also in hemophilia with good results. Gangani failed with antitoxin and succeeded with fresh rabbit serum, and concluded that the antitoxin was too old, as later proven by Wile. Baum succeeded in one hemophilic hemorrhage with serum after failure with tamponing, adrenalin and thermo-cautery. He failed in two other cases of hemophilia in children. The normal sera of different species has been much used. Dejardin advised the use of human, horse and rabbit serum in acute hemorrhage in hemophiliacs. Wile in 1907 had success with eleven cases of hemophilia with fresh horse serum, prophylactically as well as curatively. In forms of bleeding other than hemophilia the serum treatment has been found effectual. Wirth reported satisfactory experience not only in hemophilia but in tonsillotomy, epistaxis, arteriosclerosis, hemoptysis and intestinal hemorrhage. A single injection was usually sufficient to stop the bleeding. In epistaxis it was used locally. He also treated a hemophiliac girl with metrorrhagia and epistaxis, with prompt relief, by injection of horse serum, and tamponade of the uterus and vagina with gauze wet with the serum. He also stopped bleeding from the nose and mouth in a newborn baby by local application of normal serum, and checked hemorrhage of the skin and mucous membrane in cholemia of chronic hepatic cirrhosis, as well as in hemorrhoids by local use of the serum. Of great importance to the surgeon is the danger of bleeding in cholemia patients, who are compelled to submit to operation. Leary of Boston reported nine such cases of jaundice in all but one of which—as a direct result of the serum—there was no bleeding at operation. His total report covers the use of rabbit serum in twenty cases, in fifteen of which there had been hemorrhage. In five the serum was employed for prophylaxis. He records one case of hemophilia, one of pur-

pura, in which injection of 15 c.c. of rabbit serum was followed by disappearance of rheumatic symptoms and the purpura, also several cases of post-operative and typhoid hemorrhage, all of which were favorably influenced. Leary advises the use of human serum, but when haste is needed rabbit serum may be used. Diphtheria antitoxin is *usually too old* for this use. The use of normal human blood serum has given the greatest success, obviating at the same time the danger of anaphylaxis. Application of fresh blood from a normal individual is reported by Bienwald to have caused the cessation of hemorrhage in a hemophiliac child that resisted all other methods. Leary has substituted human serum for rabbits in hemophiliacs, and finds that control of the hemorrhage persists for from three to six weeks. More recently and almost spectacular is the startlingly brilliant results of John E. Welch, pathologist of the New York Lying-in Hospital. He succeeded in saving the lives of twelve cases of hemophilia-neonatorum by the subcutaneous injection of normal human blood serum in average doses of 10 c.c. two or three times daily for several days. In all these cases the bleeding began during the first week of life and varied in its source, occurring from cord, mouth, nose, bowel, stomach, intestines, vagina and subcutaneously. He says that the principal hemorrhage may be in the brain or in the liver. Perfect recovery followed in every case so treated; the bleeding diminishing with the first injection and ceasing entirely in from two to seven days. Of eighteen *previous* cases treated by drugs *seventeen* died. Results similar to Welch's are reported by Mosenthal of New York in three cases by direct transfusion of blood by Crile's method. Welch also demonstrated that normal blood serum possesses decided bactericidal properties, having perfect recovery in an apparently hopeless case of streptococœmia (puerperal). He injected a total of 50 c.c. during four successive days. This seems to me very significant and well worth while having in mind and putting into practice at the next opportunity. He also has had encouraging results from subcutaneous injection of serum in tuberculosis. Direct transfusion of blood as perfected by Crile has also given encouraging results in eclampsia and tuberculosis, and the future will undoubtedly demonstrate great advances along this line. In acute anæmia and exsanguination it is still the method of choice. Because of its dangers of hemolysis and thrombosis the use of serum is preferable. To briefly review the prophylactic use of serum. It was suggested preparatory to surgical intervention by Broca, who advised an injection twenty-four hours before operation. Hubscher used the serum previous to operation in several cases with good results. Tilman advises the prophylactic injection of serum in all doubtful cases of joint troubles not clearly diagnosed, and reports several fatalities in these cases without serum. Ev-

ery intended subject for operation of any kind should be questioned as to this taint in family, and if there is any doubt a prophylactic serum injection should precede the operation. The taking of the coagulation time of the blood of a patient is of doubtful value in this connection and unsafe, as unfortunately the coagulation time of hemophilia may show no change.

It may be well, perhaps, to review here what is known of the physiology of coagulation of the blood. It has been demonstrated and proven that fibrin which composes the network enmeshing the corpuscles in clot formation is formed by the action of fibrin-ferment upon fibrinogen. Fibrin-ferment does not exist in the circulating blood, but is formed from at least two pre-existing substances, and this only in the presence of a third substance, calcium-ions. Of these two pre-existing substances, one called prothrombin, is probably though not certainly, present in the circulating plasma. The other, or activating substance, is thrombokinase, and is never present in the circulating blood, but is only produced from certain nucleated cells—chiefly blood platelets—and from most parenchymatous tissues. Thus, coagulation of blood in wounds is much favored by the thrombokinase at once liberated from the injured cells. It is interesting to note why the clot formed in a vessel's mouth does not extend indefinitely. This is prevented by the presence in the blood of an antifibrin ferment, which neutralizes all the excess of free fibrin-ferment not combined with the fibrinogen present. On the other hand fibrin-ferment has a greater affinity for fibrinogen than for antifibrin ferment, otherwise no clot could occur. It is assumed that in hemophilia there is a relative deficiency, absence, or alteration from the normal of the prothrombin and thrombokinase and this disturbance interferes with the formation, in a normal period, of thrombin, the coagulating ferment. It is a significant fact that while the blood of a bleeder may fail to clot *after* a hemorrhage, the clotting time of the blood when *not* in hemorrhage has been found to deviate but little, and at times not at all, from the normal. Sahli has also found that the elements concerned in the formation of clot—fibrin, calcium, blood platelets and leucocytes—are present in normal amounts in hemophiliacs.

We are thus without any explanation of the failure of the blood in hemophilia to clot. In view of the failure to find any structural or chemico-biological abnormality in the blood or blood vessels, we might assume that there is an internal secretion that governs the process of coagulation, and that for some, as yet unknown, reason a deficiency (or increase) of this substance causes in the individual, hereditarily disposed, the symptom of the disease. Heretofore the treatment has been of absolutely negative value. The serum treatment of hemophilia has for its basis this reasoning: granting that in the circulating blood of the bleeder there is lacking

some element that is essential to prompt coagulation when blood leaves its vessel, and that this element here deficient, is present in physiological amount in the normal individual—the addition of normal blood serum to the blood deficient in the fibrin forming elements will give to the latter greater clot-forming properties, thereby effectually hastening coagulation. Patek of Milwaukee, whom I have here freely quoted, from a study of the literature, and a case of severe hemophilia in an adult, which he treated with normal human serum, came to the following conclusions: 1. In blood serum there is probably contained a clotting ferment or substance, either present in the circulating blood or released during a hemorrhage, which in part at least is responsible for the phenomenon of coagulation. 2. In hemophiliacs this ferment is either absent, deficient, or in some manner held in abeyance. 3. Human or animal serum applied either locally, subcutaneously, or intravenously may have a styptic action during a hemorrhage. 4. Any commercial specific serum may be used in an emergency, but because of the danger of anaphylaxis, when alien serum is employed, human serum is the product of choice. 5. In view of the danger of surgical intervention in those disposed to bleeding—in hemophiliacs and the choleric—the proven value of a prophylactic injection of serum prior to operation should make it obligatory upon surgeons to seek out these cases in every instance, and consider giving them this adequate protection. 6. Subcutaneous injection is the preferable method in most cases. 7. In massive hemorrhage transfusion should be employed, both as a styptic and to compensate for the loss. Willy Meyer very recently reported the prophylactic use of normal human serum after Welch's method in four cases of operation on the biliary organs with splendid results. These are cases which otherwise were liable to uncontrollable hemorrhage following operation. One case only of the four had any post-operative hemorrhage, and this was readily controlled by resuming the serum injections. He advises giving the prophylactic injections two days prior to operation, and continue forty-eight to seventy-two hours after operation. The technique as practiced by Welch is very simple. He draws the blood in a specially arranged flask, by inserting an aspirating needle into a vein, and withdrawing the blood by indirect suction. The blood is allowed to clot with the flask in a slanting position and the serum is withdrawn as rapidly as it separates, and is then ready for use. Welch believes that hemophilia-neonatorum is probably due to different factors, some hereditary bleeders; others due to some infection, and says that hemorrhages are sometimes caused by streptococcus and staphylococcus and in some cases by a bacillus. Blood serum is demonstrated by him to be bactericidal and thus of value in hemorrhage due to infection as well as

in bacteriæmia. He states positively that the normal blood serum in any doses never gives serum sickness or causes anaphylaxis in the human subject. When placed under the skin normal serum is quickly and readily absorbed. Two ounces may be absorbed in five minutes. To prove his contention that it is harmless, Welch injected 150 c.c. of serum from an eclamptic patient, after her twentieth convulsion, into a normal adult without the *slightest* effect. He states that it is possible that the hemorrhage in hemophilia-neonatorum is partly controlled, or in some cases entirely so by the nutritive effect of the serum on the body tissues of the infant. In infants he recommends beginning with 10 c.c. doses three times a day; in severe cases every two hours, and in larger doses if necessary. It is important to begin treatment at the first appearance of hemorrhage.

From a careful study of Crile's book on hemorrhage and the published articles of Welch, Leary, Patek, Meyer, Wile, Wirth and others, forming the basis of this paper, it seems to me to have been fairly proven that by the use of normal serum we have a means of favorably influencing various blood dyscrasias—hemophilia, hemophilia-neonatorum, cholemia—and offering a great opportunity, perhaps after further experimental work, for the rational treatment of such conditions as general infectious processes; in bacteriæmia, eclampsia and tuberculosis. In connection with the latter, Wright declares that normal human serum contains more opsonin than that of a tuberculous person. Inasmuch as the procedure of obtaining the serum and its administration is so simple and free from danger, it would seem to be perfectly feasible to extend the use of it as a prophylactic injection preparatory to operation in any subject as well as in post-operative hemorrhage from *any* cause. In many cases a relative of the patient would gladly contribute a few ounces of serum, and in other cases a donor could be obtained by advertising, and in any hospital equipped with bacteriological and pathological laboratory, the serum needed could be easily prepared. From this review and from these facts the following conclusions seem justifiable: 1. That in normal human blood serum we have an agent free from danger, simple of administration, and of proven worth in the treatment of hemophilia, hemophilia-neonatorum, and in the hemorrhagic tendency of the cholemic. 2. That further trial is needed and will probably demonstrate the successful treatment of hemorrhage from *any* cause—general infections, as bacteriæmia, septicæmia, eclampsia, tuberculosis and probably many other conditions depending upon an abnormal content of the blood. 3. That it is feasible for this work to be carried on in many hospitals and should derive an impetus from the brilliant work of the men quoted in this paper and others.

NASAL DIPHThERIA.*

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COMPARED with many of the serious and mysterious maladies to which flesh is heir, nasal diphtheria may at first thought seem so insignificant as to be hardly worth the time and consideration of even our small clinical circle. But a study of this disorder as it has cropped out during the last four and a half years at the City Hospital among the 1735 cases of major contagion which have come under my personal care there during this period—this number of patients being approximately one-half of all such illnesses reported to the Department of Health of Syracuse since January 1st, 1907—has led me to conclude beyond reasonable doubt that this seemingly trivial and infrequent nasal infection is a most important and prolific factor and one heretofore largely overlooked and minimized in spreading diphtheria in our schools, asylums, hospitals, public gatherings, street cars and amongst quarantined families.

Now my observation of diphtheria and its methods of transmission, as well as that of other contagious illnesses, has firmly convinced me that, aside from exceptional instances, the majority of all contagions are acquired by direct exposure and rarely if ever conveyed by a second or intermediate person to the third. By direct contagion I mean a route so conclusive as to be reasonable of belief. If a physician takes the temperature of a diphtheritis by mouth and negligently fails to cleanse his thermometer before introducing it within the oral cavity of his next patient, it is admitted that contagion may follow. If a man ill of nasal diphtheria blows and wipes his nose with his fingers and milks a herd of cows that supply a milk route, the development of diphtheria among his customers is mighty conclusive proof that he is the contagious agent, especially when the Klebs-Loeffler bacilli are found in the milk. But when we try to argue as Holt does in one of his illustrations that letters received and handled by a scarletina case and then tucked away in an attic for 20 years will produce scarlet fever; when we accuse the cleanly physician of carrying infection on his clothes or person; or when we try to explain to the anxious and querulous family by any of the numerous moss-covered, far-fetched theories familiar to all of us that pass current among the laity, how "Johnny got it," we expose our own credulity and impose upon that of our clientele; for so long as the indiscriminate interchange of milk bottles is in its present lax, unrestrained condition in Syracuse and elsewhere; so long as desquamating children are allowed to attend school for several days before being detected; and so long as diphtheria—nasal, pharyngeal and laryngeal—is overlooked by the inattention of

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heedless parents or undiscovered by the careless physician who depends upon one culture or none, as alas too often happens in cases of so-called tonsillitis, croup and coryza, it is undeniable and indisputable that contagion will flourish easily and luxuriantly by these obviously direct exposures and lines of least resistance. Therefore it should not be necessary in the face of these facts, except in isolated instances, for anyone but an imaginative dreamer to feel compelled to fancifully fabricate an unplausible and unscientific explanation of how contagion accomplishes rapid transit. We know that typhoid fever is sometimes conveyed by the oyster and occasionally perhaps in other erratic, devious ways. But there is no denying the fact that the number of cases so produced in the ordinary community is negligible compared with those arising from infected flies, milk and drinking water. There is no doubt either but that contagions of various sorts are sometimes transmitted and induced in crooked and obscure ways by wearing apparel, letters, money, cats, dogs, etc. But the point I wish to emphatically make is, that these and other infrequent, unproved channels of infection which we are inclined to exaggerate with holy horror and proscribe with stern, apprehensive visages, are as nothing compared with those which are flippantly ignored. If contagious diseases were as contagious as they are popularly supposed and were communicated in the promiscuous manner so many devoutly believe and fear, Syracuse would be as defunct as Pompeii in a year.

The inconsistency of the finicky was exemplified to me last fall by an eminent specialist. After operating upon a case of mastoiditis in a scarlet fever patient, he immersed hands and face repeatedly in first one delusive wash after another, gargled out his throat, and even dashed a little formaldehyde over his shoes. After this antiseptic baptismal we adjourned to a football game to "air out" as the doctor expressed it before going home. Just before entering the arena the happy thought occurred that a little popcorn might scrape a few germs off the mucous membrane of his throat. I watched him purchase it and noted that, as the vendor in the mad rush of "rah-rah" college business hastily sacked the kernels with his soiled hands, he alternately wiped a dirty, drizzling nose on his finger. My good medical brother ate the corn without a comment or a qualm.

When I was a student a few years ago, I was taught that malaria was spread by "foggy night air," by "miasma" (whatever that might have been) and by other mysterious mistaken means. With the latterday knowledge concerning the role which the anopheles mosquito plays in transmitting "fever and ague" we smile at these former silly beliefs. I prophesy that soon in the light of more exact knowledge we shall be similarly amused over many of the absurd ideas which the various camps of medicine hold today concerning the spread of contagious dis-

eases. So, too, outlandish maneuvers like imprisoning and impoverishing a whole family and then adding insult to injury by fumigating them with formaldehyde will appear as ludicrous and crude as some of the antics of our antique predecessors, the barber physicians.

However, when we pause to consider the awful havoc which all communicable diseases have wrought upon the human race in its descent from those primitive Garden of Eden days when all bacteria—including the gonococci—were just beginning to sit up and take notice, it is no wonder that the fear of such fiendish illnesses as diphtheria, scarlet fever and smallpox has surrounded them in the professional as well as in the lay mind with an exaggerated subtlety of diffusion. When an enemy is in ambush using smokeless powder and Maxim silencers, soldiers unable to locate the point of attack are likely to become panic stricken and hastily infer that they are surrounded on all sides by hostile bullets. Nor is this to be wondered at for an unseen danger is usually more terrifying and mystifying than the visible and more liable to be overestimated. To be sure contagious germs wear no gaudy uniforms nor do they trumpet their attacks loudly, yet I believe their forays are made, not with wily stratagem, but with ferocity along direct avenues. When we have more accurately mapped these apparently hidden paths, we shall control the invasion of contagion as easily perhaps as we now control yellow fever and malaria. Nasal diphtheria in my opinion is one of the byways which we must carefully watch and govern.

If one begins to look up its history one finds the paucity of matter startling. Osler's "Twentieth Century Practice of Medicine" contains only a short paragraph or two; Holt's "Diseases of Children" passes it off in a light, jovial manner; and special works on nose and throat treat it more or less insignificantly. Books of eight or ten years ago hardly touch on the subject and about all that one is able to gather from printed matter is the idea that nasal diphtheria occurs occasionally either singly or in combination with the pharyngeal form or as a mixed infection complicating other diseases. Some authorities lead one to surmise that it is usually mild, others that it is ordinarily severe. Some say that it attacks more frequently the anterior portion of the nares, while others are as positive that it locates in the naso-pharynx. Some assert that membrane is always present and describe its characteristics. Others fail to localize this feature.

When I first took charge of the City Hospital, I was confronted at once with diphtheria among my scarlet fever patients. Despite every precaution which I then knew of and could practice to prevent contamination of these patients through the nurses or through my carrying diphtheria on my own person, or in various other ways, the disorder continued to commonly prevail. Scarlet fever patients were immediately

cultured both nose and throat and I was surprised after doing this repeatedly to find returns from the bacteriologist of positive diphtheria in patients who clinically presented none of its usual features. Upon closer examination of such cases I saw in nearly every one some redness of the throat or some irritation, mild though it might be, of the nasal passages. Studying the condition still further, I became aware that many scarlet fever cases entered the hospital with diphtheria germs in their air passages. At first I was inclined to attribute this to a latent infection or to the fact that these patients had previously had an unrecognized, untreated diphtheria. To prevent the continuation of this state of affairs, I insisted that every case of scarlet fever must require a negative culture of both nose and throat before entrance to the hospital. To make assurance doubly sure, each case was recultured upon admittance and a 3000 unit immunizing dose of diphtheria antitoxin was administered. Despite this care nasal diphtheria and occasionally other forms of the disease occurred to complicate matters. Studying patients individually I discovered that many of them on entrance or at a later period occasionally blew bloody mucous out of their noses or hawked it from the naso-pharynx. Many of them had trifling nose bleeds or a bloody ichorous discharge which soon excoriated the nasal openings and sometimes the upper lip, soon covering these irritated zones with a yellowish or brownish crust. Inspection of the nose often revealed redness or whitish patches or excoriations on the septum. The irritated areas seemed to itch for children often dug them incessantly in spite of admonition and punishment, adding thereby to their extent and intensity. Finally I came to inspect daily each individual in the institution, including the nurses and help, to ascertain if possible any nasal disturbance. Every case thus brought to light though apparently of the most trifling nature was immediately cultured on two separate tubes, one for each nostril. As many as eight cultures of such suspicious cases were frequently made before a positive return from the bacteriologist. In view of these facts I have gradually drawn the following conclusions:—

First—That nasal diphtheria is a common single affliction, also a frequent complication of scarlet fever and other contagious illnesses.

Second—That the symptoms of nasal diphtheria are a bloody, or blood tinged, ichorous, serous discharge accompanied by crusting and excoriation of the septum, nasal apertures and sometimes of the upper lip. There may be in some instances a visible membrane somewhere in the nares. Itching is also a manifestation. These symptoms may be present in both nostrils or one. Occasionally the only observable early sign is the blowing of bloody mucous from the nose, the hawking of it from the naso-pharynx, or a trifling nose bleed.

Third—That the majority of the cases of nasal diphtheria are subacute and located in the anterior part of the nasal passages. Their danger seems to lie in the fact that they may induce laryngeal or pharyngeal diphtheria in those who come in intimate contact with them. The disorder does not seem to confer an immunity against a sudden extension of a severe diphtheria to the throat or larynx. In two cases I have witnessed the development of otitis media and have found the Klebs-Loeffler in the aural discharge. Diphtheria of the lips and also of the skin are phenomena once in a while accompanying the disorder.

Fourth—That a large number of pharyngeal and laryngeal cases of diphtheria are accompanied in a quiescent way with the nasal form also, and that every case of diphtheria of the throat or larynx should not be released from quarantine until at least two cultures of the nose have been reported negative.

Fifth—That a 3000 unit immunizing dose of antitoxin is uncertain as a preventive and that it protects probably only about fifty per cent. of those injected from acquiring diphtheria if closely exposed. It may be that its seeming failure is due to the fact that the case when injected already has diphtheria and that 3000 units is not a sufficient dose for its cure.

Sixth—That every case of nasal disturbance in childhood, and even in adult life, should be cultured as carefully as we now culture suspicious disturbances lower down. This rule especially should be observed in scarlet fever, measles and other contagions.

Seventh—That every case of scarlet fever and measles presenting any of the symptoms which I have enumerated as characteristic of nasal diphtheria should be cultured, each nostril separately, and this procedure should be repeated several times. Furthermore, while this is being done, such cases should be segregated from others not so afflicted and treated on the assumption that they are positive nasal diphtheria irrespective of culture returns.

Since I have acted along lines based upon these conclusions the amount of nasal and other diphtheria among my scarlet fever and measles wards has been reduced to a minimum. I believe if school inspections were carried out daily and teachers were taught to bring to the notice of school inspectors every case of cold in the head or other nasal disturbance, or if the school inspector personally had each pupil pass in review before him, and every questionable case he thus detected was promptly isolated and cultured, that a large amount of diphtheria in Syracuse would be prevented.

In considering the conclusions which I have advanced criticism may be laid at the door of the bacteriologist because of repeated negative cultures in the face of an active diphtheria. Much has been said about the inaccuracy of cultural diagnosis—especially here in Syracuse. While

mistakes may occur in the laboratory, the mistakes in cultural diagnosis are very much less than in clinical. It must be conceded that there are chances of error just as in every department of medicine and surgery. A bacteriologist is no more likely to be infallible than the clinician. They must work together. Much has been said about laboratory diphtheria and clinical diphtheria and the tendency has been to throw discredit upon the work of the bacteriologist. It is the duty of every physician to either examine cultures himself, or have them examined—repeatedly if necessary—in every suspicious sore throat, croupy condition or abnormal nasal state. Even if returns are negative and thus disconcerting to one's bump of diagnostic cocksureness in what may clinically seem positive and unquestionable manifestations of diphtheria, it is profitable before criticising the work of any laboratory, to be sure that the critic himself is not at fault. One great source of error is carelessness in taking the culture. The swab is simply put into the mouth or nose and does not come into contact with the membrane or diseased area. The swab should be rubbed near the edge of the diphtheritic membrane and not over the center of a patch. A swab should be rolled and some pressure exerted so as to squeeze out and entangle the elusive Klebs-Loeffler rascals. Sometimes it is even advisable to wait two or three hours before applying the swab to the culture media. This allows the swab to become dry and as the late Dr. May expressed it, "permits the bugs to rattle off easier." Sometimes the swab is not rubbed sufficiently on the surface of the culture medium and consequently there is no growth. These may seem trivial matters but they are well to bear in mind and practice. Let him that is without sin in some of them be the one to cast the first stone at the disparaged germ detective.

Sometimes the reaction of the culture medium is the cause of a mistake or failure as the serum may be acid or alkaline. Sometimes the serum is too wet or too dry—oftenest too dry—and the growth is disappointing as a proper amount of moisture is necessary. If the culture medium is of the proper reaction, if there is a sufficient amount of moisture, if the culture is taken with care and the tube placed in the thermostat reasonably soon after taking and left in for from 12 to 18 hours, the results ought to be satisfactory and ought to approximately parallel clinical findings. If they are not, then it should be up to the practitioner to get in touch with his bacteriologist before profanely condemning him, and have a chat about the respective case. As a matter of fact there are several germs that closely resemble the bacillus of diphtheria, especially an unnamed one which often takes up its residence in the nose. Microscopically some of these hospitable bugs are difficult to differentiate and any reasonable individual must allow that a bacteriologist may once in a while get his bacterial Bertillon records mixed and arrest the

wrong criminal. If doubt exists, the bacteriologist by a careful study of the colonization growths on the culture media can often successfully clear up a questionable case. A résumé of the clinical data written or phoned to him will assist materially to this end. Sometimes, however, despite every rule and every precaution positive diphtheria will not yield a positive culture until the case is convalescent. The explanation of such instances—which are really more frequent than is generally supposed—is that either the virulence of the germ is so enhanced as not to grow readily upon the ordinary culture pabulum, or the diphtheria bacillus is mixed with some other rude companion who has no compunction against poisoning his nursing bottle. In such cases, cultures or no cultures, one must be on guard, have sufficient faith in his clinical diagnosis and exert enough backbone to administer and readminister a proper dosage of antitoxin.

When one considers the intricacy of the nasal fossæ with their turbinated bones and their sinuses all lined with specialized epithelial mucosa, the passages tortuous and full of crypts and sulci, often already predisposingly pathological because of existing abnormalities such as catarrh, spurs, thickened turbinates, deflected septa and adenoids; and furthermore when one considers that the inhalation of air into the body in the majority of people takes place through the nose, it ought not to cause astonishment that nasal diphtheria occurs so frequently somewhere in this region.

The treatment of nasal diphtheria is worthy of a moment's consideration. A prompt dose of antitoxin of from 6000 to 12,000 units will usually suffice to clear up the case in a few weeks, though it does not act as surely or as rapidly as in pharyngeal or laryngeal diphtheria. Next to antitoxin fresh air seems to exert the most beneficial influence. Personally I have never had any success with sprays, douches or applications in this disease. Where the nares are excoriated and sore a little zinc oxide or other healing ointment seems to control these lesions satisfactorily, but I make it a rule never to discharge these patients, even though their cultures are clear, until microscopically a normal condition is apparent.

Some may incline to scoff at my opinions and conclusions and say that I am nihilistic. Even so there is nothing that has ever done medicine in general so much good as the nihilistic movement. It has led us into ways of thoughtfulness, it has made us skeptical, it has made us investigate and enquire and do research. It has, it is true, broken many idols without setting forth new gods to take the places of the dethroned. It has left us with little footing sometimes upon which to stand, but it has made us to be honest, to think, and it will make us to accomplish. It may even make us consistent in the study of contagion.

THE ETIOLOGY OF ARTERIAL SCLEROSIS.*

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THE choice of this subject for my paper was made because in my special work, neurology, there is no other one thing which presents itself for consideration so often as the condition of the arteries.

I cannot hope to bring to your attention any new facts bearing upon the subject as a whole. One or two of my experiences may be new. My purpose is to arrange some of the known facts in a new way and to correlate them with my clinical experiences. If by doing this I can add some impetus to the study of this disease and open a discussion here to-day, my purpose will have been satisfied.

Several names have been applied to arterial changes of a chronic progressive form. No apparent improvement in knowledge has followed this wealth of names and it simplifies matters to group all such changes under the head of arterial sclerosis, remembering that there are several pathologic varieties.

It is generally agreed that arterial sclerosis is due to causes acting in the blood current or on the arterial walls, or both. Etiologic inquiry, therefore, may be confined to those conditions which might exert an influence upon these. Alteration in the blood current may be due to the presence of some toxin, to the absence of some element normally present or to an alteration in the flow of the current. Alteration in the arterial walls may occur primarily in either the intima or the media. These changes may be embryonic or may be the result of a loss of the normal relation between the blood pressure and arterial resistance. In the latter instance the condition may properly be regarded as traumatic.

Heredity is an important factor in the etiology of arterial sclerosis. When we consider the frequency with which the disease appears in families and the well known family presenility, it assumes the most important place as an etiologic factor.

The influences of heredity may possibly act through both the blood current and the arterial wall. I am inclined to the belief, however, that they only act primarily through the blood current and that the arterial wall changes, if any result therefrom, are secondary. This opinion is based on clinical observations of the development of arterial sclerosis in families, and on the theory that the family tendencies to infections, on the one hand and, on the other, family immunity, exist as a result of the absence or presence of normal circulation.

I have repeatedly seen several members of a family, sufferers from chronic functional neu-

roses like migraine, neuralgias, etc., go on to the development of early arterial sclerosis. In many instances histories of similar conditions in older generations were present. You are all familiar with the over-worked phrase "a neurotic family." It is usually the phrase with which you dismiss them from your serious attention. If you watch them you will observe their unusual susceptibility to toxemias. You will find, further, that they will exhibit arterial changes early in life.

As instances of these family tendencies to toxic invasion through the circulation your attention is called to the very common family diseases, rheumatism and gout. As is well known they are very common causes of arterial sclerosis.

Several years ago I went to live among a family of mental and physical degenerates for the purpose of studying certain phases of heredity. This research was made possible through the courtesy of Dr. Ira VanGiesen, then Director of the Pathological Institute of the N. Y. State Hospitals for the Insane. Later the studies were continued in the Department of Anthropology at the Institute, of which I assumed charge. The family numbered over 400 living members. They lived in an isolated community in a neighboring state and were all subject to similar environment.

One of the most striking phases of the entire study developed in an inquiry concerning the illnesses, other than those of metabolism, from which the several branches of the family suffered. The apparent liability of one branch to infections from which another was practically free was strikingly shown by the occurrence of some cases of typhoid. As this appears to bear directly on the subject of arterial sclerosis I will mention it in detail. One branch of the family numbering 37 people had 21 cases of typhoid in 12 years. Another branch of 42 members had no cases in 12 years. The members of these branches did not live in geographic groups. They were scattered throughout the community. There was no common cause of contagion traceable. The disease was not epidemic. There were 2 cases in one year, 3 in the next, 4 in the third, 1 in the fourth, 1 in the fifth, 0 in the sixth, 3 in the seventh, 0 in the eighth, 2 in the ninth, 2 in the tenth, 1 in the eleventh, 2 in the twelfth.

All except four of these cases occurred in separate houses. In the seventh year a case occurred in a house where the disease had appeared in the second year, and in the eleventh year a case developed in a house which had had a case in the previous year.

During the twelve years there had been approximately 71 cases in the community of about 1200 people, nearly six per cent.

The branch of 42 members where no cases occurred will be seen to have enjoyed not only greater immunity than the other branch of the

* Read at the annual meeting of the First District Branch of the Medical Society of the State of New York, at Yonkers, October 12, 1911.

family but than the community as a whole, where about one in every sixteen were infected.

Of course statistics of this kind can be questioned, but I used every means with which I was acquainted to check them, and it is my judgment that we can safely assume an especial susceptibility to typhoid in the one branch of the family. Whether we can as safely assume a special immunity in the other is more questionable. In thinking back over experiences I can, however, call to mind a number of families which have been free from typhoid for several generations, and other families which appear to have had a disproportionately large number of cases. I have no doubt many of you present can do the same thing.

I found only a somewhat less striking difference in the occurrence of other acute diseases, but was unable to follow them in sufficient detail to make them available for statistics.

The facts of interest to this paper uncovered in these groups were that the branch presenting the typhoids also had had arterial sclerosis in a marked degree and showed several deaths from cerebral insult, while the other branch did not present any cases of arterial sclerosis, lived to a greater age, and there had been no deaths that I could learn of from apoplexy or nephritis.

In passing I may add that the male members of both branches of this family used alcohol in about equal amounts and frequently to excess. The majority were also users of tobacco.

Please do not understand me as presenting this as a proof of typhoid as a cause of arterial sclerosis. I think every one agrees that typhoid, as well as other acute febrile disease, may be a cause. I wish to go behind this. Many of those with arterial sclerosis never had typhoid. Several who had had typhoid showed less marked arterial disease than those who had escaped it.

The points which I would make are, first, that vulnerability to the various infections, to auto-infection and to arterial sclerosis depends upon some inherent defect. Generations are produced which are lacking in some protective agency. Second, that, while the cause of this liability may be complex, there is at least one element in it which is common to these disturbances.

The inclusion of arterial sclerosis in this group narrows the medium of invasion down to the blood current.

The premise from which we will proceed is, therefore, that the inheritance of arterial sclerosis and the appearance of early senility in families is due to the absence of some protective agent from the blood current.

If arterial sclerosis is the result of hereditary influences applied in the manner outlined, the same factors, necessarily active through life, must be the immediate causes of the disease no matter in what period of the life history of the individual it appears.

The etiology of arterial sclerosis is usually stated as heightened blood pressure or altered

arterial walls. Rise of blood pressure may be directly due to over forceful cardiac action or to contraction of the arterioles or to both. The primary cause may be at either end of the vascular system. When high blood pressure has once been established the heart and the arterioles act in concert to mechanically maintain it. When such a vicious circle has been established the situation is hopeless; we are already in the presence of something definite. Of changes which have already taken place, if not structurally, certainly functionally. Our etiology is at fault because it has taken up the condition in the middle, not at the beginning.

We will have to consider the disturbance of some function which can elevate the blood pressure independently of the mechanical action of the heart and arterioles. So far as we know the only organs outside the blood-vascular system which can exert any influence upon the blood pressure are the adrenal glands. Can the adrenals be concerned in the early manifestations of arterial disease, and, if so, how?

During the last few years there have been many interesting and enlightening experiments in the production of arterial sclerosis. We are all familiar with the blood pressure raising power of the adrenal gland. Langley has shown that repeated injections into a rabbit produced profound alterations in the aorta. These were, according to Adami, indistinguishable from the degenerations of the media as demonstrated by Moenckeberg.

The experiments of Klotz, who produced arterial changes by hanging healthy young rabbits head downward for three minutes daily for 120 days or more would appear to demonstrate that arterial sclerosis might result primarily from alteration in the relation between the blood current and the arterial walls. According to Adami these changes were most marked in the vessels of the neck which "exhibited most exquisitely a sporadic intimal sclerosis of the nodose type." There was also marked cardiac hypertrophy.

In these experiments the arterial changes might almost be described as traumatic. Adami's theory of "strain hypertrophy" appears to explain the changes satisfactorily. There was not only increased tension but a strain upon the tissues sufficient to cause, according to the author, "an aneurismal enlargement of the thoracic aorta." Thus, while the conditions produced "could not be distinguished from those seen in man," I feel, personally, that very little if any importance can be attached to these findings in so far as they may be intended to throw light upon the general subject of arterial sclerosis. The most that can be claimed for them is that they prove the possibility of a localized arterial traumatism from excessive blood pressure. It is natural to expect such an injury to be followed by the degenerative changes peculiar to a localized arterial sclerosis.

In experimental arterial sclerosis produced by

lead Roger and Gouget have reported hypertrophy of the adrenals.

Vacuez, Aubertin, Aschoff, Pearce (*Journal of Experimental Medicine* 10-1908-pg. 735), Reid and others have noted the presence of hypertrophy of the adrenals in arterial sclerosis.

Mott (Albutt's System) says that advanced arterial sclerosis is most often associated with atrophy of the adrenals.

On critical examination the apparent discrepancy between these findings disappears. We again apply Adami's theory of "strain hypertrophy" and his other of "overstrain atrophy." Whether the changes in the adrenals are primary or secondary does not effect the application. Increased activity either in the function of the gland or in the blood supply to it would put a strain upon it which, up to certain limits, would produce hypertrophy. When the physiological limits had been passed and fatigue begun the tissues would begin to undergo atrophic changes with an ultimately resulting small, hard gland.

These reported experiments and post-mortem findings leave little room for doubt that the adrenals are intimately associated with arterial disease, and the high tension resulting from the administration of a single dose of the extract of the gland and the artificial production of the disease by continued adrenal feeding apparently indicate that these glands must be involved primarily, not secondarily.

If the physiologic action of the adrenals were perfectly understood it might not be difficult to reach a definite conclusion. With our limited knowledge on this point the best we can do, however, is to keep on theorizing.

Experimental studies since the time of Brown-Sequard, who made his first reports in 1856, have been somewhat conflicting even as to whether the adrenals were necessary to the maintenance of life. Brown-Sequard thought they were, and the most recent investigators bear him out. It is now known that life is not supportable for any length of time after complete removal of the adrenals. In all recent experiments death, usually from asthenia with diarrhoea and marked irritation of the nervous system, has resulted in varying lengths of time.

Several investigators have found that the blood of an animal becomes conspicuously toxic after the removal of the adrenals. Blood from an animal thus operated when injected into a normal animal produced marked irritation of the nervous system. These nervous symptoms reminded me of those I had seen in severe acute diseases. Death resulted or was hastened when the same blood was injected into an animal one of whose adrenals had been removed.

The conclusions are obvious that after operation substances were circulating in the blood which were not present in a normal state, or toxins normally present were there in greatly increased quantities. The removal of the adrenals lowered the animal's resistance to the

toxins to such a degree that death ensued. In other words the adrenals are protective organs, exerting their influence upon or through the blood current.

Further experiments upon the muscles of dogs seem to indicate that the adrenals protect the system against toxins of muscular activity. This point is, however, not positive.

To recapitulate. Inherited tendencies to arterial sclerosis, to family presenility and probably to the ordinary infections and to auto-infection are due to the faulty functioning of some organ normally protecting metabolism through the blood current. This means the adrenals.

Second. It has been demonstrated, as I have shown above, that adrenal feeding will produce arterial sclerosis. If the adrenals are protective organs and if we increase their activity and thereby produce the disease which we are trying to prove is due to the failure of their functions, what becomes of our theory? It is conceivable that with a blood pressure maintained at a point in harmony with metabolism the addition of a quantity of adrenalin sufficient to raise the blood pressure might so far disturb metabolism that toxins would be produced at an increased rate. If this toxin production were sufficient the effect would be the same as though the production were normal and the protective activity of the glands lowered.

Third. In considering the high blood pressure present early in arterial sclerosis as due to the overactivity of the adrenals we must agree that overactivity of a functioning tissue can only be called for by the presence of an unusual task. The only thing which could call for an overactivity of the adrenals is the presence in increased quantities of those substances in the blood against which the glands afford protection.

Fourth. The progress of arterial sclerosis is accompanied by progressive changes in the adrenals. Whatever part the adrenals may have played in the beginning is continued, but, as the disease progresses, becomes a secondary factor in the persisting high blood pressure. As long as the heart action continues forceful enough it is that organ, acting in concert with the overful arterioles which maintains the blood pressure. When the heart muscle begins to fail blood pressure is lowered. This coincides with the findings of Mott, who, you will remember, reports atrophic adrenals in the late stages of arterial sclerosis. Had the adrenals remained active the blood pressure should have remained up.

In this connection I wish to call attention to two clinical facts which undoubtedly many of you have observed. First, in the final stage of arterial sclerosis toxemias are common. I have often seen more or less temporary rises of temperature in these cases which were undoubtedly toxic and which if present at all in the earlier stages were very infrequent. While it may be

straying far afield to connect these toxemias with the cessation of adrenal function no other adequate explanation offers. Second, I have often seen these advanced cases kept comfortable, and perhaps alive, for several years by regularly administered small doses of strychnia. While strychnia is supposed to be contraindicated in arterial sclerosis you will find it of advantage in these terminal cases. My theory is that the strychnia takes the place of the missing adrenal action by maintaining the blood pressure, through the heart perhaps. I have tried out this theory by administering adrenal glands to two cases who had been on strychnia. In one case the results were satisfactory. In the other while there was an appreciable increase in blood pressure the patient was uncomfortable. I have recently begun the adrenal gland feeding on two others but as they had never taken strychnia I cannot compare them. They are more comfortable than they were before the administration, and the blood pressure is higher.

While you may not agree with all the conclusions which I have drawn, which I admit have the disadvantage of being largely theoretical, I think that there can be no doubt but that the adrenals are directly concerned in the pathologic processes discussed. Further inquiry may prove that the adrenals are not alone but that the other ductless glands join with them in affording protection to the circulation. I believe that the explanation of the etiology of arterial sclerosis can be reached only through these channels.

PHYSIOLOGY IN SCHOOLS.*

By LUZERNE COVILLE, M.D.,
ITHACA, N. Y.

THE opening of the school year brings up anew the question of the physical fitness of the individual pupil. Upon this factor of fitness rests the whole matter of his or her success in school.

Parental ignorance or parental carelessness most often determines this fitness, or lack of fitness. Not all the school sanitation and all the school inspection can put right the faults of home and of childhood. Upon the education of this generation depends the hygiene of the next; to overcome the ignorance of the past generation there must be ingrafted the best of teachings in applied physiology, personal hygiene and a reasonably thorough knowledge of self. For very early in the course of thoughtful childhood there comes the sudden revelation of the fact of his own personality. Perhaps all other counts sink into insignificance beside this. Often no one but the child is aware of this change; he never speaks of it, yet it is a life event with him. Does he begin to brush his hair, is he self con-

scious, does he begin to copy his elders without the favor of consulting them; in any case there begins the welding of the five senses into common sense. The boy begins to be an individual, begins to be a person, wakes up and uses his mind.

At this period it is well to begin to ingraft some study of self that shall be of immediate service to him and his.

As early as June 1894 there crept into the school laws of the state under the title of Miscellaneous Provisions a subtitle "Physiology and Hygiene in the Public Schools." So far, so good. These subjects—it goes on to recite—shall be taught to all pupils in all schools supported by public money and under state control "*with special reference to the effects of alcoholic drinks, stimulants, and narcotics on the human system.*" And it further provides that all public school teachers shall be properly certified as having satisfactorily passed these subjects "with especial reference to alcoholic drinks, stimulants, and narcotics on the human system." In the following year, we find "An act to amend the consolidated school law providing for the study of the nature and effect of alcoholic drinks, and other narcotics *in connection with* physiology and hygiene in the public schools." This act also provided that there should be questions in the "Regents," regulated text-books, etc. *It also provided that all payment of school monies should be stopped unless affidavit was made each year by some person in authority in each school that physiology and hygiene and "dope" instruction upon the effects of alcoholics or narcotics were taught each week for at least one-fourth the school year in every school year from and including the fourth grade and including the first year of the High School—in other words, for six consecutive years and it further prescribes the amount of "dope" to be taught and how.* This law was amended somewhat in 1906 and was incorporated substantially as has been indicated into the Educational law of 1909. The fine hand that drew this law, now 17 years old, is only 32 thousand strong in the state (The W. C. T. U.), but the law is none the less a menace to the state, to the public, to the pupil, and to freedom of the individual. Many of us believe it to be a pernicious law. Many teachers and pedagogues do not believe it possible to carry it out—good or bad. Most teachers will tell you that it is not enforced. The Syllabus for Secondary Schools, issued each five years, by the New York State Educational Department and dated Albany 1910 provides a course in biologic sciences. This comprises the triple headings of botany, zoology, and physiology and hygiene. This syllabus while it notes some small amount of work upon narcotics does not include at all the amount indicated in the law. Nor does this syllabus in any way indicate that this work is to be given every year to all pupils during the time indicated.

Neither is it wise nor is it possible seemingly

* Read at the annual meeting of the Sixth District Branch of the Medical Society of the State of New York, at Elmira, N. Y., October 17, 1911.

to incorporate so much of this work into the already overburdened school year. So much then for this work of the reformer who looks with much disfavor upon many of her fellow townsmen and feels so much of violence against people of opposite thought with her. The law is undoubtedly bad; why not then strictly enforce it and thus kill it?

What substitute, then, can be made for this bad law? The syllabus of the Regents is a good one so far as it goes. It outlines well the beginning of physiology and tends to draw some lessons of hygiene. Much more could be added with good effect along the lines of personal hygiene which Dr. Fisher insists gives the motive and stimulus to the individual citizen and tends to maintain and develop semipublic and public hygiene. Personally applied, one's own health, the health of family:—these preach and bring home the importance of public health. There follows public force and a stronger American Commonwealth.

Again, the teaching of physiology through the field of biology and the great out-of-doors is most thoroughly logical. Moreover, it promotes enthusiasm, originality, and spontaneity in the pupil. It causes him to reason and it asks him to investigate, to observe and to question. Having acquired information, it will not be a hardship for him to express it—the honesty of truth,—and so aid the accumulating of facts and evidence, leading up to its purely human significance.

The home again is the strength of our nation. Not many of our pupils at 14 years of age but know much of the facts of the sex question:—but from whom? Many know it badly because of bad informants. Fortunately a few of our youth have been morally standardized at home. Youth is innately and normally honest, and gentle to his womankind. But a stream of influence is turned loose upon the child in his formative years; if his counsels are wise and his copies good, he is good. Or he may become the opposite. And indeed the great liberty of our American girl and woman needs some safeguarding. And this brings us for a moment to the question of sex hygiene. For several years, Austria, Germany, and England have carefully and thoughtfully introduced into their schools instruction upon this subject in what corresponds to our last years of high schools. There is certainly no physician living but knows how crying is this need in our schools, and colleges. But just how and by what means is yet to be thoughtfully worked out. J. M. Tyler of Amherst has voiced the opinion that the physician is responsible for public education in physiology and hygiene, rather than various societies of social hygiene. Often their promulgation of knowledge is most demoralizing and worse than present conditions. For a little knowledge is most dangerous. Yet we are in an era of new ideas and this is but one of the problems of the public awaken-

ing. There is no reason why our youths should not learn why they should be morally and physically clean.

A report only a short time ago, not based upon pure theory nor on medical science grounds, but on close observation, says—"The canteen (army) by unfortunate legislation was abolished in 1901 and it has gravely damaged the prospect of true temperance among the soldiery."

The investigations of such men as Hultgen tend to disprove many old ideas, *e. g.*, that alcohol even in small quantities has ultimately the result of producing abnormalities and lesions of the nervous system and has as definitely disproved any reprehensible action upon the viscera and only slightly upon the digestive system but rather reserving all its selective action on nervous tissue.

In the same way Meylan's statistics of the use of tobacco seems to show that the normal healthy adolescent boy turns instinctively to tobacco without harm if used moderately; and that such users are the best developed boys.

Perhaps quite as much abuse of athletics is apparent today as of drugs and yet with moderate regulation athletics are wholesome and natural. Moderation here helps the young man or the young woman to healthier habits, physical and mental—the "making good" in life.

The discussion of regular and regulated eating, regular sleeping, the avoidance of constipation, the modification of the ice cream soda water and candy habit often common in school life, these and many other habits, are of greater influence and profit than teaching from a prescribed textbook that does not deal with facts.

Farther than this there are certain school rights in the way of centralization of school regulation that may be fairly discussed. The time is fairly ripe and the public awake to modern needs.

Among workers and writers of today, the accomplished work of one young man is worthy of especial attention. I refer to Mr. William H. Allen of New York. His earnestness, his way of putting the facts and his unbiass are my warrant. Indeed, I would earnestly recommend that you know what he has already done, that you may help him to do more.

Dr. Gulick's report on the children who quit school is most instructive. A large percentage of these youths of 14-16 years, a part only of whom claim ill health, suffer from growth changes and take any excuse for a life "in the open." A close study will find many cases of abnormal development, that are largely relieved when away from the school routine. These unfortunates are worthy of including in our scheme of physiology and hygiene. And not an inconsiderable number of this yearly army of quitters become a community burden for lack of hygienic advice and instruction.

The field is broad and has but barely been turned in a few places. There is much more

of items that could be rehearsed, but the potent question so often asked is relevant "What is the use?" The opinion of physicians is so often cast aside as irrelevant and biased. Could the laws of hygiene be formulated by physician and practical pedagogue much of real benefit might accrue not to him or them but to the youngster who under the present law and its application knows little of physiology and cares less, and tomorrow is a parent. And then he does care and wonders why he had not better and wiser instruction.

Without seeming to be personal in this, I would most heartily recommend this whole matter again to our fraternal representatives in our legislature and urge such immediate re-enactment of this law as shall be at once valid, rational, and withal wholesome. Much has been done in wise enactments. We render to Cæsar the things that are Cæsar's! The remedy lies largely with the physicians of our state.

TUBERCULOSIS OF THE CHOROID AFTER SIX WEEKS TREATMENT WITH TUBERCULIN.*

By L. W. CRIGLER, M.D.,
NEW YORK, N. Y.

Patient B. C. female age 17, was first seen by me on January 21st, 1911. She gave the following history:

About Jan. 7th, 1911, sight in the left eye began to fail rapidly, with numerous black spots floating before the field of vision. There was no pain in the eye at any time nor was the eye at all reddened.

Family History: Father died at age of 40, cause unknown. Mother died when 32 of pulmonary tuberculosis. There are three other children living, all apparently in good health. One brother died in infancy. Patient has always had perfect health.

Her general appearance suggests no sign of disease. Physical examination reveals normal abdominal and thoracic viscera.

The eye condition as seen by me when she first presented herself for examination, was that of typical cyclitis, with the characteristic triangular deposits on Descemet's membrane beautifully outlined. The vitreous was quite cloudy, so that the entire retina and vessels were obscured; opacities being large and numerous. Vision was 20-100 minus.

Von Pirquet's skin test was made and proved positive. Systemic reaction also followed inoculation. It was impossible to state whether or not there was local reaction in the choroid. There was no conjunctival injection; however, the diagnosis was cyclitis of tubercular origin.

* Read and case shown before the Ophthalmological Section of the New York Academy of Medicine, March 20, 1911.

On this assumption subcutaneous injections of tuberculin every other day were begun Jan. 25th, 1911. The initial dose was 1-10,000 m.g., which was increased 1-10,000 m.g. at each injection until a dose of 1-1000 m.g. was reached. Then the dose was further increased 1-1000 m.g. at each injection until the maximum dose of 1-200 m.g. was given. The treatment has been continued up to the present time, March 20th, 1911. In all, eighteen injections were given, and no other treatment, either local or general, was instituted.

Her vision today is 20-30 plus, with correction. The vitreous is quite free from opacities, and the outlines of the destructive process are easily seen occupying a circumscribed area in the retina and choroid in the inferior nasal zone, just posterior to the ciliary body.

The area involved is somewhat larger than ordinarily found, but the heaping up of pigment in the area external to the two destructive foci might be taken to be the result of a reactionary inflammation. The rest of the eye ground is practically free from inflammatory disturbance, and the picture, apart from the area mentioned, is that of a normal fundus.

It would be interesting to know just what course this case would have taken had the tuberculin not been used. The rapid progress toward recovery is gratifying, and demonstrates very clearly the potency of this agent in combatting localized tubercular affections of the eye.

LEGISLATIVE NOTES.

The Committee on Legislation herewith presents the lists of members of the Senate and Assembly for the year 1912. Members of the Society can refer to this list at any time that it may seem advisable to write to their Assemblymen or Senators in regard to legislative matters and all are requested to look it over so that if among those represented there are any men known to them personally they can write them, if requested by the Committee on Legislation to assist or oppose any bills before the Legislature.

In the next issue of the Journal it is hoped to be able to print the Committees, which had not been appointed when this issue went to press.

T. F. Conway, Lieutenant-Governor and President of the Senate, Albany. Home Post Office, Plattsburg.

1. J. L. Long, D., Oyster Bay, N. Y.
2. *Dennis J. Harte, D., 35 Stevens Street, L. I. City.

SENATE.

BROOKLYN.

3. *Thomas H. Cullen, D., 256 President Street.
4. Loring M. Black, Jr., D., 376 McDonough Street.
5. *Barth S. Cronin, D., 573 Clinton Street.
6. *Eugene M. Travis, R., 436 Grand Avenue.
7. *Thomas C. Harden, D., 161 Metropolitan Avenue.
8. James F. Duhamel, I. L., 202 Bay 28th Street.
9. Felix J. Sanner, D., 58 Breman Street.
10. James H. O'Brien, D., 21 Shepherd Avenue.

MANHATTAN.

11. *Christopher D. Sullivan, D., 277 Broadway.
12. *Timothy D. Sullivan, D., 214 E. 11th Street.
13. James D. McClelland, D., 43 Barrow Street.
14. *Thomas F. Grady, D., 151 E. 30th Street.
15. *Thomas J. McManus, D., 452 W. 49th Street.
16. *Robert F. Wagner, D., 1297 Lexington Avenue.
17. John Godfrey Saxe, D., 44 W. 45th Street.
18. Henry W. Pollock, D., 309 Broadway.
19. *Josiah T. Newcomb, R., 27 William.
20. *James J. Frawley, D., 51 E. 96th Street.
21. *Stephen J. Stilwell, D., 3311 Olinville Avenue.
22. Anthony J. Griffin, D., 891 Cauldwell Avenue.

STATE.

23. *Howard R. Bayne, D., 75 St. Mark's Place, New Brighton, S. I.
24. *J. Mayhew Wainwright, R., Rye.
25. *John B. Rose, R., Roseton.
26. Franklin D. Roosevelt, D., Hyde Park.
27. William Pierson Fiero, D., Catskill.
28. Henry M. Sage, R., Menands.
29. *Victor M. Allen, R., Petersburg.
30. *E. T. Brackett, R., Saratoga Springs.
31. Loren H. White, D., Delanson.
32. *Seth G. Heacock, R., Ilion.
33. *James A. Emerson, R., Warrensburgh.
34. *Herbert P. Coats, R., Saranac Lake.
35. *George H. Cobb, R., Watertown.
36. T. Harvey Ferris, D., Utica.
37. Ralph W. Thomas, R., Hamilton.
38. J. Henry Walters, R., Syracuse.
39. *Harvey D. Hinman, R., Binghamton.
40. *Charles I. Hewitt, R., Locke.
41. John F. Murtaugh, D., Elmira.
42. Frederick W. Griffith, R., Palmyra.
43. *Frank C. Platt, R., Painted Post.
44. Thomas H. Bussey, R., Perry.
45. George F. Argetsinger, R., Rochester.
46. William L. Ormrod, R., Churchville.
47. Robert H. Gittins, D., Niagara Falls.
48. Frank M. Loomis, D., Buffalo.
49. *Samuel J. Ramsperger, D., Buffalo.
50. George B. Burd, D., Buffalo.
51. *Charles M. Hamilton, R., Ripley.

ASSEMBLY.

ALBANY.

1. Harold J. Hinman, R., Albany.
2. John G. Malone, R., Albany.
3. John L. Gibeau, R., Cohoes.

ALLEGANY.

Ransom L. Richardson, R., Fillmore.

BROOME.

Arthur J. Ruland, D., Binghamton.

CATTARAGUS.

*Ellsworth J. Creney, R., Sandusky.

CAYUGA.

Michael Grace, R., Weedsport.

CHAUTAQUA.

1. *Julius Lincoln, R., Jamestown.
2. *John Leo Sullivan, R., Dunkirk.

CHEMUNG.

*Robert P. Bush, D., Horseheads.

CHENANGO.

*Walter A. Shepardson, R., Otselic.

*Re-elected.

CLINTON.

Charles J. Vert, R., Plattsburgh.

COLUMBIA.

John L. Crandell, R., Philmont.

CORTLAND.

*Charles F. Brown, R., Cortland.

DELAWARE.

*Clayton W. Wheeler, D., Hancock.

DUTCHESS.

1. Myron Smith, R., Millbrook.
2. *Lewis S. Chanler, D., Red Hook.

ERIE.

1. Charles G. Page, R., Buffalo.
2. Clinton T. Horton, R., Buffalo.
3. Henry J. Rahl, R., Buffalo.
4. *Edward D. Jackson, D., Buffalo.
5. *Richard F. Hearn, D., Buffalo.
6. James M. Rozan, D., Buffalo.
7. *Gottfried H. Wende, D., Buffalo.
8. *Clarence MacGregor, R., Buffalo.
9. *Frank Bret Thorn, R., Buffalo.

ESSEX.

Spencer G. Prime, 2nd, R., Upper Jay.

FRANKLIN.

*Alexander McDonald, R., St. Regis Falls.

FULTON AND HAMILTON.

*Alden Hart, R., Gloversville.

GENESEE.

*Clarence Bryant, R., Le Roy.

GREENE.

*J. Lewis Patrie, D., Catskill.

HERKIMER.

Theodore D. Robinson, R., Warren.

JEFFERSON.

1. Henry E. Machold, R., Ellisburg.
2. *John G. Jones, R., Carthage.

KINGS.

1. Daniel Barnes, R., 24 Schermerhorn Street.
2. *William J. Gillen, D., 12 Vanderbilt Avenue.
3. *Michael A. O'Neil, D., 12 Luqueer Street.
4. George Langhorst, R., 133 Rutledge Street.
5. *Abraham F. Lent, R., 960 Jefferson Street.
6. George Heiberger, R., 451 Willoughby Avenue.
7. *Daniel F. Farrell, D., 378 17th Street.
8. *John J. McKeon, D., 413 Smith Street.
9. Albert H. T. Banzhaf, R., 75 82d Street.
10. *Frederick M. Ahern, R., 434 Park Place.
11. *William W. Colne, R., 11 Irving Place.
12. Frederick W. Singleton, R., 506 Eighth Avenue.
13. Charles Schmitt, R., 73 Bushwick Avenue.
14. James A. Garvey, D., 78 Nassau Avenue.
15. Thomas Wilmott, D., 222 N. Henry Street.
16. Forrest S. Chilton, R., 1657 E. 21st Street.
17. *Edward A. Ebbetts, R., 416 Jefferson Avenue.
18. *Almeth W. Hoff, R., 460 Stratford Road.
19. *Jacob Shifferdecker, D., 225 Hamburg Avenue.
20. Frank Bennett, R., 1362 Bushwick Avenue.
21. *Harry Heyman, D., 319 Lorimer Street.
22. Edward R. W. Karutz, R., 308 Cornelia Street.
23. William F. Matthewson, R., 41 Granite Street.

LEWIS.

Humphrey E. Slocum, R., Beaver Falls.

LIVINGSTON.

*John C. Winters, Jr., R., Mount Morris.

MADISON.

Morrell E. Tallett, R., De Ruyter.

MONROE.

1. Jared W. Hopkins, R., Pittsford.
2. *Simon L. Adler, R., Rochester.
3. *August V. Pappert, R., Rochester.
4. *Cyrus W. Phillips, R., Rochester.
5. *William T. Keys, R., Scottsville.

MONTGOMERY.

Walter R. Gage, R., Canajoharie.

NASSAU.

Jeremiah Wood, R., Lynbrook.

NEW YORK

1. *Thomas B. Caughlan, D., 81 Varick Street.
2. *Alfred E. Smith, D., 25 Oliver Street.
3. John C. Fitzgerald, D., 175 Second Avenue.
4. *Aaron J. Levy, D., 307 E. Broadway.
5. James J. Walker, D., 6 St. Luke's Place.
6. *Harry Kopp, R., 89 Avenue B.
7. *Peter P. McElligott, D., 428 W. 24th Street.
8. *Moritz Graubard, D., 276 Grand Street.
9. *John C. Hackett, D., 500 W. 41st Street.
10. Meyer Greenberg, D., 104 2d Avenue.
11. *John H. Boylan, D., 418 W. 51st Street.
12. *James A. Foley, D., 316 E. 18th Street.
13. James C. Campbell, D., 842 10th Avenue.
14. *John J. Herick, D., 149 E. 40th Street.
15. Henry J. Crawford, R., 252 W. 73d Street.
16. *Martin G. McCue, D., 155 E. 47th Street.
17. *Franklin Brooks, R., 230 Riverside Drive.
18. *Mark Goldberg, D., 222 E. 81st Street.
19. *Andrew F. Murray, R., 304 W. 109th Street.
20. *Patrick J. McGrath, D., 300 E. 81st Street.
21. Dean Nelson, R., 76 W. 131st Street.
22. *Edward Weil, D., 224 W. 87th Street.
23. S. Clinton Crane, R., 525 W. 182d Street.
24. *Thomas A. Brennan, D., 150 E. 91st Street.
25. Francis R. Stoddard, Jr., R., 38 W. 9th Street.
26. *Abram Goodman, R., 1263 5th Avenue.
27. Charles A. Dana, R., 55 W. 51st Street.
28. *Jacob Levy, D., 1885 Lexington Avenue.
29. Thomas S. Coleman, R., 859 Lexington Avenue.
30. *Louis A. Cuvillier, D., 172 E. 122d Street.
31. *Max Shlivek, R., 56 W. 114th Street.
32. Morris S. Spector, R., 440 E. 140th Street.
33. William B. Ruddick, R., 627 Eagle Avenue.
34. Charles P. Fleck, R., 1788 Bathgate Avenue.
35. John Yule, R., 943 Grant Avenue.

NIAGARA.

1. Karl S. Brong, R., Lockport.
2. *Henry A. Constantine, R., Niagara Falls.

ONEIDA.

1. Ralph Entwistle, R., Utica.
2. *Herbert E. Allen, R., Clinton.
3. *James T. Cross, R., Rome.

ONONDAGA.

1. Charles R. Milford, R., Skaneateles.
2. David L. Edwards, R., Syracuse.
3. *Thomas K. Smith, R., Syracuse.

ONTARIO.

*Thomas B. Wilson, R., Hall.

ORANGE.

1. *Caleb H. Baumes, R., Newburgh.
2. *John D. Stivers, R., Middletown.

ORLEANS.

*Frank A. Waters, R., Medina.

OSWEGO.

*Thaddeus C. Sweet, R., Phoenix.

OTSEGO.

Willard D. Bullion, R., Richfield.

PUTNAM.

*John R. Yale, R., Brewster.

QUEENS.

1. *Andrew Zorn, D., Long Island City.
2. *Alfred J. Kennedy, D., Whitestone.
3. Adam Metz, Jr., R., Ridgewood.
4. James A. Bell, R., Richmond Hill.

RENSSELAER.

1. C. Frederick Schwarz, D., Troy.
2. *Bradford R. Lansing, R., Rensselaer.

RICHMOND.

Ralph McKee, D., New Brighton.

ROCKLAND.

*George A. Blauvelt, D., Monsey.

ST. LAWRENCE.

1. Frank L. Seaker, R., Macomb.
2. *Edwin A. Merrit, Jr., R., Potsdam.

SARATOGA.

George H. Whitney, R., Mechanicsville.

SCHENECTADY.

Herbert M. Merrill, Soc., Schenectady.

SCHOHARIE.

*Daniel D. Frisbie, D., Middleburg.

SCHUYLER.

*John W. Gurnett, D., Watkins.

SENECA.

Nelson Duntz, R., Fayette.

STEUBEN.

1. *Thomas Shannon, R., Bath.
2. *John Seeley, D., Woodhull.

SUFFOLK.

1. *DeWitt C. Tallmage, R., East Hampton.
2. George L. Thompson, R., Kings Park.

SULLIVAN.

*John K. Evans, D., Bloomingburg.

TIOGA.

John G. Pembleton, R., Owego.

TOMPKINS.

*Minor McDaniels, D., Enfield.

ULSTER.

1. Andrew J. Cook, R., Kingston.
2. *Samuel C. Waring, R., New Paltz.

WARREN.

*Henry E. H. Brereton, R., Bolton.

WASHINGTON.

*James S. Parker, R., Salem.

WAYNE.

*Albert Yeomans, R., Walworth.

WESTCHESTER.

1. Tracy P. Madden, D., Yonkers.
2. *William S. Coffey, R., Mount Vernon.
3. *Frank L. Young, R., Ossining.
4. George A. Slater, R., Port Chester.

WYOMING.

*Henry A. Pierce, R., Castile.

YATES.

Edward C. Gillett, R., Penn Yan.

*Re-elected.

Medical Society of the State of New York

PRIZE FUNDS.

All essays in competition for the prize funds of the Medical Society of the State of New York must be in the hands of the Chairman of the Committee, Dr. Albert Vander Veer, 28 Eagle Street, Albany, N. Y., on or before March 1, 1912. The Lucien Howe Prize is open to all members of the profession; the Merritt H. Cash Prize only to members of the Medical Society of the State of New York. Each is of the value of \$100.

MEETING OF THE COUNCIL.

A regular meeting of the Council of the Medical Society of the State of New York was held at the State Society rooms, 17 West 43d Street, New York, on December 15, 1911, at 3.05 P. M.

Present: Drs. Wendell C. Phillips, R. P. Bush, W. F. Campbell, G. D. Gregor, Alexander Lambert, T. H. McKee, G. C. Madill, W. T. Mulligan, Mark O'Meara, Frank Overton, Wisner R. Townsend, J. M. Van Cott, P. W. van Peyma and Sherman Voorhees.

Minutes of the last meeting were read and approved. A resolution was presented from the Second District Branch, asking that the Council reconsider the resolutions presented by Dr. Chase at the annual meeting of the State Society, January 26, 1910, which were as follows:

First. That the Medical Society of the State of New York shall appoint a committee of four, whose duty shall be to urge on all practitioners of medicine in this State, greater care in making early diagnosis in cases of suspected uterine cancers.

Second. *Resolved*, That this Committee be directed to devise some method by which, along ethical lines, women may be properly informed as to the reason why they should seek early professional advice in menstrual disorders; and that they are further instructed to consider some more comprehensive plan, whereby a general diffusion of appropriate and vital knowledge may be promulgated on this very important subject.

Third. *Resolved*, That this Committee be directed to report its recommendations at the next meeting of the Society.

Fourth. *Resolved*, That the Treasurer of this Society be directed to honor payment of bills incurred for printing and needful correspondence (if not otherwise provided for), and that this Committee be empowered to fill vacancies in its membership, and appoint sub-committees, if deemed expedient.

Upon motion duly seconded and carried, the request was laid on the table.

The request of the Medical Society of the County of Erie for the approval of the following addition to the by-laws was presented:

"No one shall become a member of this Society or continue as such, who engages in contract work, unless it be governmental in character, but this shall not prohibit an agreement for a particular case nor apply to examination for an adequate fee."

It was moved, seconded and carried that the amendment be disapproved in its present form and that it be referred back to the Medical Society of the County of Erie.

The Secretary presented the requirements for admission to the Medical Society as in force in the County of New York and suggested that as they had been approved and would meet the requests of the County of Albany and others who desired to admit members working in laboratories, etc., that the county societies be notified that such an addition to their by-laws would

meet with the approval of the Council. The new section would then read:

"Physicians in good moral and professional standing, residing or practicing in the County of _____, duly licensed and recorded in the office of the County Clerk of _____ County, and graduates in medicine engaged in teaching or in scientific research in subjects allied to medicine in a reputable institution, college, laboratory, or hospital situated in the County of _____, are eligible for active membership in The Medical Society of the County of _____, the _____ District Branch, and The Medical Society of the State of New York, by fulfilling the requirements for the admission of members laid down in the By-Laws."

The Treasurer reported \$10,300 on hand and stated that the bank balance would be about the same at the close of the fiscal year as it was a year ago, and that the income and expenditures were about equal.

Reports from standing committees were then called for.

Dr. Neuman, Chairman of the Committee on Scientific Work, was absent.

Dr. Nellis, Chairman of the Committee on Arrangements, was absent.

Dr. Van Cott, Chairman of the Committee on Public Health, reported progress.

Dr. Bush, Chairman of the Committee on Legislation, reported that the resolution of the Medical Society of the County of Erie, in regard to a bill for educational requirements of midwives, which had been referred to him, was worthy of notice and that he would be pleased to support any legislation looking to that subject when presented in the legislature, as he was informed it would be.

Dr. van Peyma spoke of the methods in force in the City of Buffalo.

Dr. Bush referred to the question of sterilization of convicts and suggested that the State Society should take some measure towards framing a bill for that purpose as other States had already done, and quoted from the bill passed in New Jersey last session.

The Council, on motion duly seconded and carried, requested Dr. Bush to refer the matter to the House of Delegates at its next session.

The President then spoke of plans for the next annual meeting.

There being no further business the Council adjourned at 4.25 P. M. WISNER R. TOWNSEND,
Secretary.

The Secretary is endeavoring to secure the portraits of all the ex-Presidents of the society to be hung in the offices of the society. The number including 1807 and 1911 is 86 and already 22 have been obtained and many more promised.

Assistance in securing the portraits of the following will be greatly appreciated:

W. McClelland, 1807; N. Romaine, 1808; W. Wilson, 1811; J. R. B. Rogers, 1812; J. White, 1815; A. Coventry, 1823; J. R. Manley, 1825; J. Eights, 1830; T. Spencer, 1832; J. H. Steele, 1834; S. Ely, 1840; J. B. Beck, 1841; W. Taylor, 1842; S. White, 1843; J. A. Wing, 1844; J. Webster, 1845; J. McCall, 1846; T. W. Blatchford, 1847; A. H. Stephens, 1848; A. Thompson, 1850; R. G. Frary, 1851; J. S. Sprague, 1853; C. R. Coventry, 1854; A. March, 1856; A. Willard, 1857; T. C. Brinsmade, 1858; B. F. Barker, 1859; D. T. Jones, 1860; E. H. Parker, 1861; T. Hun, 1862; D. P. Bissell, 1863; F. Hyde, 1864; H. W. Dean, 1865; J. P. White, 1869; E. M. Moore, 1873; W. H. Bailey, 1880; H. Jewett, 1882; A. Hutchins, 1883.

CIRCULAR LETTER OF THE COMMITTEE ON EXPERIMENTAL MEDICINE.*

DEAR SIR:

At a meeting of the Committee on Experimental Medicine of the Medical Society of the State of New York, held at 17 West 43rd Street, December 15th, 1911, the following resolutions were unanimously passed:

Having been informed that measures calculated to injure the public health interests which we represent are being prepared for introduction in the Legislature of 1912, we, the Committee on Experimental Medicine of the Medical Society of the State of New York, beg leave to submit the following:

For the last five years especially, the Legislature has been beset by the opponents of scientific animal experimentation, who have demanded the enactment of bills for the investigation, regulation, obstruction or abolition of this indispensable means of progress in medical science. The demand for such legislation invariably shows ignorance of or indifference to the present law against cruelty to animals, and its effective prohibition of irresponsible animal experimentation; ignorance of or indifference to the careful oversight and kind treatment of animals, and the necessarily limited observation which marks their use in the incorporated institutions which alone have the right to use them; ignorance of or indifference to the incalculable debt which the public health owes to animal experimentation for the discoveries whose use has removed one disease after another from the category of dreadful plagues to one of minor nature; and finally, ignorance of or indifference to the daily reliance of health officers, hospitals and private practitioners upon the use of animals for the diagnosis and treatment of tuberculosis, diphtheria, typhoid fever, epidemic meningitis, rabies, and other dangerous diseases.

So numerous and so impressive are the evidences of public confidence in the importance of animal experimentation in relief of human affliction, that its opponents have had difficulty in assuming a basis of opposition that would not put them in conflict with the common sense of the people in a matter so closely concerning public welfare. Each year, however, they come before you with modified demands, conceding what they must, but intent on securing any insidious advantage that may come to hand, of present or prospective kind.

We beg leave to inform you that the Medical Society of the State of New York is prepared, as heretofore, to protest by every legitimate means, and with the utmost vigor, against the slightest encroachment on animal medical research that may be brought by any one to its attention.

We respectfully urge you not to lend countenance to such misguided movements, even to the extent of introducing a bill relating thereto, without kindly giving this Committee an oppor-

tunity to lay fully before you the merits of the case of the Medical Society of the State of New York.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF FRANKLIN.

ANNUAL MEETING AT MALONE, DECEMBER 12, 1911.

The Comitia Minora met at 1.45 P. M., a quorum being present. Several bills were presented and ordered paid.

The Society was called to order by the President at 2 o'clock, and the minutes of the last meeting were read and approved.

The minutes of the Comitia Minora were read and approved.

The following officers were elected for the ensuing year: President, Dr. E. A. Rust, Moira; Vice-President, F. F. Finney, Burke; Secretary and Treasurer, Dr. G. M. Abbott, Saranac Lake; Censor for Two Years, Dr. C. C. Trembley, Saranac Lake; Censor for Three Years, Dr. J. A. Grant, Malone; Delegate to State Medical Society, Dr. P. F. Dolphin, Malone; Alternate, Dr. G. H. Oliver, Malone.

The reports of the Secretary and Treasurer were read and accepted as read.

On account of ill health Dr. Albert H. Allen, of Saranac Lake, tendered his resignation as a member of this Society, by vote the same was accepted and the Secretary instructed to convey the deepest sympathy of the Society to Dr. Allen in his affliction.

The following preamble and resolution on the death of Dr. E. S. McClellan, of Saranac Lake, were offered by Dr. E. R. Baldwin, seconded and passed:

WHEREAS, Death has removed one of our most venerable and useful members in the person of Dr. E. S. McClellan, and

WHEREAS, We deem it our duty and privilege to express our appreciation of his unfailing interest in public health and professional matters relating to medicine and of his activity in promoting hygiene,

Resolved, That we inscribe these sentiments upon our records and instruct the Secretary to present a copy to the family of the deceased.

By vote of the Society, the Delegate to the State Society was instructed to vote and use his influence for the adoption of the measure whereby the State Society shall assume the enforcement of the laws regulating the practice of medicine when that matter is brought to the attention of the House of Delegates at its next meeting.

The following resolutions were unanimously adopted:

Resolved, That the Medical Society of the County of Franklin urges the immediate construction of a county tuberculosis hospital and that an appropriation be made at once by the Board of Supervisors; also

Resolved, That Dr. B. F. Dolphin be requested to present these resolutions to the Board of Supervisors at its next meeting.

The President appointed the following committees: Legislation, Drs. P. F. Dolphin, J. A. Grant and H. H. Kinghorn. Public Health, Drs. A. G. Wilding, C. C. Trembley and J. S. Van Vechtin. Milk Commission, Drs. E. R. Baldwin, D. C. Twitchell, S. F. Blanchett, P. F. Dolphin and H. Furness.

SCIENTIFIC SESSION.

President's Annual Address, A. H. Garvin, M.D., Raybrook.

"County Medical Matters," P. H. Dolphin, M.D., Malone.

"Errors in Diagnosis in Pulmonary Tuberculosis," H. S. Goodall, M.D., Lake Kushaqua.

"Report of a Case of Imperforate Anus," C. E. Stickney, M.D., Constable.

Dr. Abbott read a brief memorial sketch of the life of E. S. McClellan, M.D., Saranac.

* Addressed to Members of the Legislature.

MEDICAL SOCIETY OF THE COUNTY OF
NEW YORK.

ONE HUNDRED AND SIXTH ANNUAL MEETING, IN NEW
YORK CITY, NOVEMBER 27, 1911.

The programme consisted of the reports of the Officers and Committees.

The report of the Treasurer is as follows:
Summary of Accounts for the Year Ending November
19, 1911.

Income and Expenditure Account.
Receipts.

Balance on hand November 19, 1910.....	\$2,680.64
Dues from Members	\$13,572.50
Initiation Fees	1,640.00
Fines for Illegal Practice	2,400.00
Milk Commission	5,358.10
Refund of Costs <i>in re</i> Ewald.....	86.85
Miscellaneous .....	.75
	<hr/>
	23,058.20

Disbursements.

State Assessment (1906) arrears.....	\$15.00
State Assessment (1909) arrears.....	3.00
State Assessment (1910) arrears.....	756.00
State Assessment (1911)	6,546.00
Services and Disbursements of Counsel.....	3,600.00
Services and Disbursements of Milk Commission	4,812.55
Services and Disbursements of Secretary...	440.88
Services and Disbursements of Treasurer...	265.50
Printing and Engraving	1,234.67
Clerical Services and Supplies	1,549.04
Collations	600.00
Rent of Academy	372.50
Funeral Notices	10.00
Special Committee Expenses	232.37
Delegates' Expenses	280.00
Bond for Treasurer	15.00
Special Expenses <i>in re</i> Ewald.....	127.50
Costs (advanced) <i>in re</i> Ewald.....	86.85
Legislative Information	75.00
Insurance (Fire)	9.20
Initiation Fees Refunded	16.00
Miscellaneous Expenses	27.00
	<hr/>
	\$21,064.86

Balance on hand November 20, 1911.....	4,673.98
	<hr/>
	\$25,738.84

Chas. H. Richardson, Treasurer, in account with the
Medical Society of the County of New York.
Balance Sheet for the Year 1910-1911.

Liabilities.

Balance Income and Expenditure Account...	\$4,673.98
On Deposit in Union Square Savings Bank, November, 1910	2,070.61
On Deposit in Union Dime Savings Bank, November, 1910	2,539.70
On Deposit in German Savings Bank, Novem- ber, 1910	2,595.58
Interest	267.56
Union Square Savings Bank.....	\$73.07
Union Dime Savings Bank.....	89.65
German Savings Bank	104.84
	<hr/>
	\$12,147.43

Assets.

Cash in Lincoln National Bank	\$4,673.98
Cash in Union Square Savings Bank.....	2,143.68
Cash in Union Dime Savings Bank.....	2,629.35
Cash in German Savings Bank	2,700.42
	<hr/>
	\$12,147.43

Respectfully submitted,
CHAS. H. RICHARDSON, *Treasurer.*
November 23, 1911.

The foregoing accounts together with the vouchers
have been examined and found correct.

(Signed) FLOYD M. CRANDALL, M.D.,
EDWARD F. HURD, M.D.,
WILLIAM B. HOAG, M.D.,
Committee on Audit.

The report of the Counsel was of unusual interest
and showed a large amount of work done in the prose-
cution of irregular practitioners, especially of the
wealthy corporation type. Included in this category are
Christian Scientists, New Thought advocates, mental
healers, and other similar persons claiming to alleviate
suffering by methods not included in the curriculum of
any medical college in the civilized world.

Further, your Counsel, under the authorization of the
Board of Censors, has made a vigorous attack upon the
wealthy and incorporated strongholds of quackery by
prosecuting members of corporations organized under
the Laws of the State of New York and engaged in
the practice of medicine through registered physicians.

The report showed that the convictions numbered 41;
fines collected, \$5,750; and sentences suspended, 6. Six-
teen cases are still pending.

A vote of thanks was extended to Mr. Vandiver and
his office for the splendid work of the year.

The report of the Committee on Public Health and
Education was to the effect that the lectures would be
carried on the coming year and promised to be of
unusual interest.

The Society, during the past year, has held eight
stated and one special meetings with a total attendance
of 2,162, an average attendance of 240.

There have been elected to membership during the
year 184 members; for election at this meeting, 22.
Loss by death, 27; loss by resignation, 30; loss by trans-
fer to other societies, 8; expelled, 2, a total loss of 67,
showing a net gain for the year of 79.

The report of the Committee on the Revision of the
Constitution and By-Laws, as appointed by the President
at the stated meeting of May 22, 1911, was received
and the amended Constitution and By-Laws adopted by
the Society.

The following Officers, Censors and Delegates were
elected: President, Charles Gilmore Kerley; First Vice-
President, Brooks H. Wells; Second Vice-President,
T. Passmore Berens; Secretary, John Van Doren
Young; Assistant Secretary, J. Milton Mabbott; Treas-
urer, Charles H. Richardson. Censors: Edward S.
Peck, H. Seymour Houghton, Frederick E. Sondern.
Delegates to The Medical Society of the State of New
York: James P. Tuttle, George R. Satterlee, Emil Alt-
man, George Howard Fox, Irving S. Haynes, Edmund
Prince Fowler, Louis Faugeres Bishop, Frederic W.
Loughran, Linsly R. Williams, David Bovaird, Lewis A.
Connor, Victor C. Pedersen, Brooks H. Wells, John
Van Doren Young, Thomas S. Southworth, James F.
McKernon, J. Bentley Squier, Seymour Oppenheimer.

Owing to the lateness of the hour the scientific pro-
gramme scheduled was omitted.

MEDICAL SOCIETY OF THE COUNTY OF
SCHENECTADY.

ANNUAL MEETING AT SCHENECTADY, DECEMBER 12, 1911.

The following officers were elected for the ensuing
year: President, A. S. Fay, Schenectady; Vice-Presi-
dent, F. C. Reed, Schenectady; Secretary, H. P. Groes-
beck, Schenectady; Treasurer, G. V. Johnson, Schenec-
tady. Censors: D. L. Kathan, J. E. Reed and H. V.
Mynderse, all of Schenectady. Delegate to State Soci-
ety: H. G. Huches, Schenectady; Alternate, J. H. Col-
lins, Schenectady.

After the election of officers the President, Dr. J. H.
Collins, delivered an address.

MEDICAL SOCIETY OF THE COUNTY OF
CHAUTAUQUA.

ANNUAL MEETING AT DUNKIRK, DECEMBER 12, 1911.

The following officers were elected for the ensuing year: President, Henry A. Eastman, Jamestown; Vice-President, Nelson G. Richmond, Fredonia; Second Vice-President, George F. Smith, Falconer; Secretary and Treasurer, J. W. Morris, Jamestown. Censors: E. M. Scofield, Jamestown; A. A. Becker, Jamestown; V. M. Griswold, Fredonia. Delegate to State Society, M. N. Bemus, Jamestown; Alternate, Ellis W. Storms, Falconer.

SCIENTIFIC SESSION.

"The Conservation of Health in Chautauqua County," William M. Bemus, M.D., Jamestown.

"General Peritonitis," A. A. Becker, M.D., Jamestown.

"The Relations of the State Department of Health with the Medical Profession and the Importance of Vital Statistics," A. D. Lake, M.D., Gowanda.

"The Everlasting Breakfast," N. G. Richmond, M.D., Fredonia.

"Vincent's Angina," V. M. Griswold, M.D., Fredonia.

THE FULTON COUNTY MEDICAL SOCIETY.

ANNUAL MEETING, DECEMBER 14, 1911.

The following officers were elected for the ensuing year: President, Fenton I. Gidley, Johnstown; Vice-President, Burton G. McKillip, Gloversville; Secretary, Claude Bledsre, Gloversville; Treasurer, D. V. Still, Johnstown. Censors: Vernon R. Ehler, Gloversville; Nelson Everest, Gloversville; D. A. Murphy, Gloversville. Delegates to State Society: George Lenz, Gloversville; Alternate, William J. Peddie, Gloversville.

MEDICAL SOCIETY OF THE COUNTY OF
ULSTER.

ANNUAL MEETING AT KINGSTON, DECEMBER 5, 1911.

The following officers were elected for the ensuing year: President, George W. Ross, Port Ewen; Vice-President, Adelbert H. Mambert, Kingston; Secretary, Mary Gage-Day, Kingston; Treasurer, Frederick Snyder, Kingston. Censors: Mark O'Meara, Kingston; Aden C. Gates, Kingston; Daniel Connelly, Kingston; Buel Maben, Kingston, and Frank L. Eastman, Kingston. Delegate to State Society: Henry Van Hovenberg, Kingston; Alternate, A. H. Palmer, Marlborough.

SCIENTIFIC SESSION.

President's Address, George H. Chandler, M.D., Kingston.

Symposium on Hemorrhage.

Discussion opened by E. E. Norwood, M.D., Kingston; George W. Ross, M.D., Port Ewen.

Symposium on Kidney.

Discussion opened by Mark O'Meara, M.D., Kingston; A. A. Stern, M.D., Kingston.

SCHOHARIE COUNTY MEDICAL SOCIETY.

ANNUAL MEETING, AT COBLESKILL, DECEMBER 12, 1911.

The following officers were elected for the ensuing years: President, John J. Beard, Cobleskill; Vice-President, Lyman Driesbach, Middleburg; Secretary, Carolyn L. Olendorf, Cobleskill; Treasurer, LeRoy Becker, Cobleskill. Censor: W. T. Rivenburgh, Middleburg. Delegate to State Society, C. W. Best, Middleburg. Delegate to Third District Branch, C. L. Olendorf, Cobleskill.

SCIENTIFIC SESSION.

"The Practical New Discoveries in Medicine and Surgery," George Lenz, M.D., Cobleskill.

"Ectopic Gestation and Report of Case," LeRoy Becker, M.D., Cobleskill.

"Placenta Prævia and Report of Case," C. L. Olendorf, M.D., Cobleskill.

Reports of cases by other members and discussion of all papers.

MEDICAL SOCIETY OF THE COUNTY OF
CHENANGO.

ANNUAL MEETING AT NORWICH, DECEMBER 12, 1911.

The following officers were elected for the ensuing year: President, Anna White-Marquis, Norwich; Vice-President, Thomas B. Fernald, Norwich; Secretary, Paul B. Brooks, Norwich; Treasurer, James B. Drake, Norwich. Delegate to State Society: Paul B. Brooks; Alternate, George D. Johnson.

The President-elect appointed the following committees: Public Health Committee, Paul B. Brooks, Chairman, Edwin Gibson and Alpha R. Morse; Legislative Committee, James B. Drake, Chairman, L. A. Van Wagner, John Van A. Jacobs.

The following amendment to the by-laws was submitted, as follows: "Members whose dues or assessments are unpaid on May 1st, or who are under suspension, shall not be eligible for nomination, election, or appointment to any official position in the Society, nor shall they be entitled to vote or to receive the notices, publications, or privileges of the Society until their dues are paid."

In accordance with the by-laws this will have to lie over until the next annual meeting for action.

The Chairman of the County Library Committee reported progress in the organization of the library, and \$25 was appropriated for the use of the committee, \$50 having been appropriated last year.

SCIENTIFIC SESSION.

"Ectopic Pregnancy," Aaron B. Miller, M.D., Syracuse.

"Syphilis," Henry C. Baum, M.D., Syracuse.

"The County Tuberculosis Hospital," John B. Huber, M.D., New York.

MEDICAL SOCIETY OF THE COUNTY OF
ALBANY.

REGULAR MEETING, AT ALBANY, DECEMBER 12, 1911.

SCIENTIFIC PROGRAM.

SYMPOSIUM ON THE LUNGS.

"Anatomy," Walter A. Reynolds, M.D., Albany.

"Pathology," Ellis Kellert, M.D., Albany.

"Symptoms and Diagnosis," Clinton B. Hown, M.D., Albany.

"X-Ray as an Aid to Diagnosis," Arthur F. Holding, M.D., Albany.

"Treatment," Erastus Corning, M.D., Albany.

"Surgery," John H. Gutmann, M.D., Albany.

COUNTY OF ROCKLAND MEDICAL SOCIETY.

ANNUAL MEETING AT NEW CITY, DECEMBER 6, 1911.

The following officers were elected for the ensuing year: President, M. J. Sullivan, Haverstraw; Vice-President, Dr. John C. Dingman, Spring Valley; Secretary, Dr. Ralph DeBaun, Congers; Treasurer, Dr. A. K. Doig, Nyack.

The question of the possible removal of Dr. Doty as health officer of New York was taken up, and the sentiment of the physicians present was unanimous against such removal. The following telegram was sent to Governor Dix, at Albany:

To Governor John A. Dix, Albany, N. Y.

The County of Rockland Medical Society, in regular session at New City to-day, emphatically protests against the removal of Dr. Alvah H. Doty, Health Officer of the Port of New York.

(Signed) ROBERT R. FELTER, *President*.

RICHARD SLEE, *Secretary*.

A telegram was also sent to Dr. Doty:

To Dr. Alvah H. Doty, Rosebank.

The County of Rockland Medical Society, in session to-day sent a protest to Governor Dix against your removal.

The business session was followed by an interesting paper on "Vaccines and Serums in Preventive Medicines."

QUEENS-NASSAU MEDICAL SOCIETY.

THE SEMI-ANNUAL MEETING, AT MINEOLA, DECEMBER 5, 1911.

After the reading of the minutes of the last meeting and the report of the Censors, the following officers were elected for the ensuing year: President, H. M. Warner, Hempstead; Vice-President, W. G. Frey, Long Island City; Secretary-Treasurer, J. S. Cooley, Mineola. Censors: R. F. Macfarlane, Long Island City; L. N. Lanehart, Hempstead; G. K. Meynen, Jamaica; A. G. Rave, Hickvills; M. M. York, Flushing, Historian; Walter Lindsay, Huntington. Delegates to the Medical Society of the State of New York for one year: W. G. Frey, Long Island City; W. A. Gibson, Huntington; J. E. Hutcheson, Rockville Centre. For two years, W. J. Malcolm, Jericho; J. J. Kindred, Long Island City.

SCIENTIFIC SESSION.

"Our Present Knowledge of Infantile Paralysis," G. W. Faller, M.D., Oyster Bay.

"Acute Poliomyelitis, with Report of a Recent Case," F. T. Delano, M.D., Rockville Centre.

Discussion by Drs. Parsons, Howe, Hancock, and others.

"Vital Statistics," W. A. Howe, M.D., Deputy State Commissioner of Health.

Discussion opened by J. H. Bogart, M.D., Roslyn.

President's Address on "City and Country Hospitals," A. W. Jagger, M.D., Flushing.

Through the courtesy of the President, Dr. Jagger, a collation was served to the physicians in attendance, there being about twenty-four present.

A public health mass meeting was held in the Mineola Firemen's Hall, at 8 o'clock Tuesday evening, at which an entertaining illustrated lecture upon Sewage Disposal was given by Mr. H. B. Cleveland, Assistant Engineer of the State Department of Health.

MEDICAL SOCIETY OF THE COUNTY OF CHEMUNG.

ANNUAL MEETING AT ELMIRA, DECEMBER 19, 1911.

The following officers were elected for the ensuing year: President, Charles H. Haase, Elmira; Vice-President, William Brady, Elmira; Secretary, Charles F. Abbott, Elmira; Treasurer, George Van R. Merrill, Elmira. Censors: H. W. Fudge, R. G. Loop and S. Voorhees, all of Elmira. Delegate to State Society: R. G. Loop, Elmira; Alternate, E. T. Bush, Horseheads. Delegate to Sixth District Branch: H. W. Fudge, Elmira; Alternate, C. H. Haase, Elmira. Chairman Public Health Committee: A. H. Baker, Elmira. Chairman Committee on Legislation: R. P. Bush, Horseheads.

Amendments to the By-Laws were proposed, increasing annual dues from \$4 to \$5, and amending Chapter X, Section 2, to read as follows:

"Members whose dues or assessments for the current year are unpaid on May 1st, or who are under suspension, shall not be eligible for nomination, election, or appointment to any official position in the Society, nor shall they be entitled to vote or to receive the notices, publications, or privileges of the Society until their dues are paid."

Mr. Theodore Horton, Chief Engineer of the State Health Department, addressed the meeting on "Water Filtration," followed in the evening by an address at Convention Hall on "Sewage Disposal," before a public mass meeting, given under the auspices of this Society. His remarks were illustrated with stereopticon views.

ONONDAGA MEDICAL SOCIETY.

ANNUAL MEETING, DECEMBER 12, 1911.

The following officers were elected for the ensuing year: President, John C. Shoudy, Syracuse; Vice-President, Edward B. Kaple, Elbridge; Secretary, Henry B. Doust, Syracuse; Treasurer, Allen Cone, Syracuse.

Censors, A. B. Breese, E. H. Shepherd, G. M. Price, George Rockwell and E. J. Wynkoop, of Syracuse. Delegate to State Society, D. H. Murray, Syracuse.

SCIENTIFIC SESSION.

"Carriers of Disease," Chas. F. Prest, M.D., State Department of Health, Albany.

President's Address, B. F. Chase, M.D., Syracuse.

MEDICAL SOCIETY OF THE COUNTY OF RENSSELAER.

ANNUAL MEETING, DECEMBER 12, 1911.

The following officers were elected for the ensuing year: President, J. H. F. Coughlin, Troy; Vice-President, Wm. Kirk, Jr., Troy; Secretary, A. J. Hambrook, Troy; Treasurer, O. F. Kinloch, Troy. Censors: J. A. Barnes, Troy; J. H. Flynn, Troy. Delegates to State Society: James Lyons and C. F. Kivlin, both of Troy.

SCIENTIFIC SESSION.

President's Address, M. Keenan, M.D., Troy.

"Demonstration of X-Ray Plates and Cases," T. A. Hull, M.D., Troy.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

ANÆSTHESIA AND ANALGESIA. By J. D. MORTIMER, M.B. (Lond.), F.R.C.S. (Eng.). Anæsthetist, Royal Waterloo Hospital; Throat Hospital, Golden Square; St. Peter's Hospital for Stone, etc.; Instructor, Medical Graduates' College. London. University of London Press. Published for the University of London Press, Ltd., by Hodder & Stoughton and Henry Frowde. Price, \$2.00.

MINOR SURGERY. By LEONARD A. BIDWELL, F.R.C.S., Surgeon to the West London Hospital, Dean of the Post-Graduate College, Consulting Surgeon to the Blackheath and Charlton Hospital and to the City Dispensary, and author of "Handbook of Intestinal Surgery." With eighty-eight illustrations. London. University of London Press. Published for the University of Lond. Press, Ltd., by Hodder & Stoughton and Henry Frowde. Price, \$2.00.

SCIENTIFIC FEATURES OF MODERN MEDICINE. By FREDERIC S. LEE, Ph.D., Dalton Professor of Physiology, Columbia University. New York. The Columbia University Press. 1911.

INTERNATIONAL CLINICS. A quarterly of illustrated clinical lectures and especially prepared original articles on Treatment, Medicine, Surgery, Neurology, Pædiatrics, Obstetrics, Gynæcology, Orthopedics, Pathology, etc. Edited by H. W. CATTELL, A.M., M.D., Philadelphia, U. S. A., with the collaboration of Wm. Osler, John H. Musser, A. McPhedrin, Frank Billings, Chas. H. Mayo, Thos. H. Rotch, John G. Clark, James J. Walsh, J. W. Ballantyne, John Harold and Richard Kretz. Volume IV., Twenty-first series, 1911. Philadelphia and London. J. B. Lippincott Company. 1911. Price, \$2.00.

BOOK REVIEWS.

PREVENTION OF INFECTIOUS DISEASES. By ALVAH H. DOTY, M.D., Health Officer of the Port of New York. New York and London. D. Appleton & Company 1911.

The especial value of this book is due to the experience of the author. Dr. Doty, first as Chief of the Division of Contagious Diseases in the Health Department, and then for sixteen years as Health Officer of

the Port, has had an experience in preventing infectious diseases probably unequalled by any person living.

The author considers the subject in a broad, general way, and also applies it in particular to Quarantine.

The first chapter is unusually important and interesting, in that it presents the writer's view on the relative importance of the infected person and of clothing, cargo, etc., which have come more or less in direct contact with infection.

Many examples of his personal experience are given to establish his position, that the common belief that infectious diseases are frequently transmitted through the medium of articles and materials other than excreta is erroneous. He recognizes, as do all who are informed on the subject, that in rare instances certain infectious diseases are so carried, but he believes that the conditions under which this can happen are unusual and are known and can be avoided.

He considers in detail the different quarantinable diseases, and points out fully the practical measures to be taken to prevent their transmission.

Disinfection and Disinfectants are considered in three chapters. A special importance is given to the value of boiling water and steam in sterilizing infected materials.

There is an interesting chapter on the use of the Clinical Thermometer in detecting diseases among immigrants or other persons who are seen only for a moment and who do not speak a common language.

The chapter on the mosquito, the methods for its extermination, and its relation to malaria and yellow fever, completes this most interesting and valuable work.

This book is of great interest to all of those who are engaged in combating infectious diseases, and is invaluable to health officials on land or at quarantine stations.

His views as to the relative importance of persons and goods in transmitting disease may be considered extreme by some, but they are coming more and more to be accepted by those who have had the greatest experience in this line.

The book is written in a very clear and not in a technical language, so that even laymen may read it not only with interest, but to their great advantage.

W. H. P.

CHEMICAL AND MICROSCOPICAL DIAGNOSIS. By FRANCIS CARTER WOOD, M.D., Professor of Clinical Pathology, College of Physicians and Surgeons, Columbia University, New York; Director of the Laboratories and Attending Physician at St. Luke's Hospital, New York. Third edition, with one hundred and ninety-four illustrations and nine colored plates. D. Appleton & Company.

The first edition of this book appeared in 1905, the second in 1909, and this third edition was called for two years later. This gives proof of the popularity of the work which seems to the reviewer to be well merited. It is divided into nine parts. Two hundred and fifty-eight of the seven hundred and twenty-eight pages is taken up with the consideration of the blood in its physiological, chemical, morphological, pathological and bacteriological relations to diagnosis. The most modern serum reactions are described in detail, and their diagnostic value discussed.

Part II deals with the examination of gastric contents and a discussion of the diagnostic significance of the results obtained in such examinations.

Part III contains a fairly good description of fæces and its examination. The chemical part of this part is open to the criticism of being inaccurate in some particulars. The statements on page 326 in reference to the curds in infants' stools are not in accord with the facts, as now generally believed.

Part IV, dealing with parasites, could be improved by a differential description of the eggs as found in the stools. Otherwise this section is satisfactory.

Parts V and VI deal with the examination of nasal secretions and sputum respectively.

Part VII, consisting of 222 pages, is good and con-

tains all that is of practical use in this field of diagnosis.

Part VIII includes the examination of exudates and transudates, direct and by cultural methods, and by animal inoculations, lumbar puncture, the determination of the opsonic index, the preparation of bacterial vaccines, the Wassermann and other reactions, etc.

Part IX contains a short, concise description of milk and its examination. This is followed by a very useful Appendix, in which is contained descriptions of reagents, stains, volumetric solutions and the methods of making them. Altogether, this book is a work to be recommended to the student or practitioner who wishes a reliable guide to laboratory diagnosis by chemical and microscopical means, or who wishes to keep posted on the newer methods, their technic, and, more especially, those who wish to know how to interpret the results of laboratory examinations made by others. E. H. B.

AN ANATOMICAL AND SURGICAL STUDY OF THE FRACTURES OF THE LOWER END OF THE HUMERUS. By ASTLEY PASTEN COOPER ASHHURST, A.B., M.D. Philadelphia and New York. Lea & Febiger. 1911.

Of all the essays on fractures of the lower end of the humerus, this one is by far the best we have read.

The author quotes writers of many nationalities who generally express the opinion that deformity and interference with function are to be anticipated after fracture in the region of the elbow.

Dr. Ashhurst then states that the results in the vast majority of cases will be perfectly satisfactory if common-sense surgical treatment is intelligently applied. Commencing with the anatomy and development of the region, the author takes up the classification. He describes ten varieties of fracture, giving radiographic illustrations of each variety. The method of treatment is accurately described. There are many photographs showing the results of treatment. We cannot too strongly commend the author's views on enforced violent passive motion. He speaks of this method of treatment as follows:

"The children kicked, screamed and yelled; their parents, the orderly and the nurse held them still, while they suffered excruciating pain. More osteogenetic and inflammatory processes were aroused than were present before, and no elbow fracture was seen which did not stiffen up under this treatment."

If every one who treats these injuries could study this little book we would see few of the bad results which are still far too common.

Dr. Ashhurst received the Samuel D. Gross Prize of the Philadelphia Academy of Surgery for 1910, in recognition of this essay, which the committee believed to be one of "great value."

W. B. BRINSMADE.

THE DISEASES OF INFANCY AND CHILDHOOD for the use of students and practitioners of Medicine. By L. EMMETT HOLT, M.D., Sc.D., LL.D., Professor of Diseases of Children, College of Physicians and Surgeons, New York; Attending Physician, Babies' and Foundling Hospitals, New York. Assisted by JOHN HOWLAND, A.B., M.D., Professor of Diseases of Children, Washington University, St. Louis; Late associate in diseases of children, College of Physicians and Surgeons, New York. Sixth edition, with two hundred and forty illustrations, including eight coloured plates. New York and London. D. Appleton & Company. 1911.

This sixth edition of Holt's well-known book reflects further credit upon the authors because so many sections have been rewritten. This has been made necessary by the rather rapid advances which have been made during the last two or three years, particularly along the line of the infectious diseases of children. Along many other lines there has also been a less marked advancement, and these have received due recognition.

There are abundant evidences throughout the book

of its careful revision, and while the advances have been noted, there has been a corresponding elimination of much of the older material, so that the whole volume is not needlessly enlarged. In most instances this curtailment has not taken materially from the value of the abbreviated chapters.

The revision of this work so shortly after the preceding edition must insure its reception as one of the few dependable volumes upon the diseases of children and justifies its acceptance as a text-book of the first rank.
LE G. K.

MANUAL OF THE DISEASES OF THE EYE. By CHARLES H. MAY, M.D. (Seventh Edition.)

This book, as indicated by the author in his first edition, is intended for medical students who have to pass their examination in ophthalmology in order to obtain their degree of M. D. and for the general practitioner who may desire to consult a work on this subject having all the salient and essential facts presented in as brief, lucid and concise manner possible consistent with thoroughness.

That the author has succeeded in accomplishing this is attested by the fact that the book has now passed its seventh edition and been translated into several foreign languages.

The arrangement of chapters is excellent and well calculated to take the student step by step through the domain of ophthalmology in as brief manner as possible without cumbersome and unnecessary reading.

A little more emphasis and space, it seems to us, should have been devoted to the indications, contra-indications and danger of the use and abuse of atropin in Diseases of the Eye and, while it has been briefly mentioned, yet sufficient importance has not been given to it.

The cuts and plates are very good and serve their purposes excellently. Calmette's tuberculin test, Kroenlein's operation, Lagrange's operation for glaucoma, the uses of Salvarsan (606) and the added chapter on "The Ocular Manifestations of General Diseases," are some features in this seventh edition which show the author's evident intention of keeping the work up to date and a pace with scientific ophthalmology.

It is a splendid work both for the teacher and student and we know of no other of its kind that equals it.

J. S. W.

THE SENSIBILITY OF THE ALIMENTARY CANAL. By ARTHUR F. HERTZ, M.A., M.D. (Oxon.), F. R. C. P., Assistant Physician and Physician in charge of the Department for Nervous Diseases, Guy's Hospital.

This little monography of some eighty pages contains much of interest to every practitioner of medicine or surgery.

The subject matter discussed, and the conclusions drawn, and also proven therefrom, covers a field to which but scant attention has been given by most of us.

Surely there is no one symptom with which we are more continuously brought in contact than pain. Therefore, anything which will point toward explanation of the cause of this departure from the normal sensation should be most welcome.

The lecture which will probably create the most universal interest, is that devoted to the cause of pain, especially that of gastric or duodenal ulcer.

It would seem as if the stage of ulceration present at the time of application of Hcl might make some difference as to the sensibility of the ulcer surface.

The experiment on page 26 would seem to prove beyond any doubt the value of the "muscle sense."

The fact that in appendicitis and gall stones we have increased Hcl secretion, cannot be too often repeated.

The space devoted to emptiness and hunger is captivatingly written.

The two varieties of constipation discussed merit attention. It is not by all agreed, however, that we never find hyperacidity without organic disease.

The reasons for the time limits of pain occurrence in ulcers variously located are clearly stated.

It is well that the book was not concluded without some consideration of our friend the neurasthenic, who is ever with us.

To sum up, this volume should be indispensable to the man practising internal medicine, and might be read with much profit by most of our surgeons as well.

H. W. LINCOLN, M.D.

OBITUARY.

DR. E. S. McCLELLAN

Dr. E. S. McClellan, of Saranac Lake, one of the oldest members of the State Society, died from a paralytic stroke at the home of his daughter in Northampton, Mass., whither he had gone but a few days before. The writer of this had the pleasure of having him for a companion on the way, an acquaintance of many years, and had never known him more alert both mentally and to a reasonable degree physically. He had reached the ripe age of 87 and was led to comment with some justifiable complacency on his well preserved vigor. Happy is it thus to fill the full round of a useful and active life and, too, to end it quietly in the surroundings of those of his own household and family.

He had lived many years in Saranac Lake and that community is indebted to him to a large degree for the well ordered condition in its sanitary existence which the village enjoys today. In proximity to the world famous sanitarium of Dr. Trudeau it was a foregone event that it should become itself a resort for the tuberculous. It developed upon the board of health to make this an enduring and safe thing; this was done and largely through the work of Dr. McClellan, who was for many years and indeed till recently the village health officer. He found great satisfaction in telling of the results of the work, and especially in showing that the records of native mortality from tuberculosis at the present time when it is freely given to be a refuge for those thus affected is less than in the years past when it had not yet so become. No better proof exists of the freedom from risk of communicating this disease when the few simple requirements are scrupulously met than this village affords and likewise no one can ask for a better monument to his memory than our deceased old associate has in this attainment.

DEATHS.

JOSEPHINE GRIFFITH DAVIS, M.D., New York City, died November 7, 1911.

LE FAYETTE RINKLE, M.D., Boonville, died December, 1911.

ANDREW BENEDICT YARD, M.D., New York City, died December 19, 1911.

JOSEPH EDWARD JANVRIN, M.D., New York City, died Dec. 21, 1911.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

ALGERNON THOMAS BRISTOW, M.D., Editor

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Vol. XII.

FEBRUARY, 1912

No. 2

EDITORIAL DEPARTMENT

THE PROVISIONAL PROGRAM.

COMMENTS BY THE PRESIDENT.

To the Members:

The provisional program is completed and appears on page 94 of the present issue of the STATE JOURNAL. You are invited to give it a careful perusal and it is hoped that it will receive the enthusiastic approval which has already been accredited to it by the officers. The program is so complete that it is unlikely that many more changes of papers will be made. Great credit is due to the section officers for their intelligent and most untiring efforts to complete their programs three months before the date of the annual meeting.

The total number of papers of the five sections exceeds 150; the varied character of the papers covering every field of Medicine, Surgery and Public Health. Inasmuch as many of the topics deal with social problems they should attract not only the members of the medical profession of our own and other states but should command the attendance of many interested spectators from the general public. For instance all the meetings of the Section on Public Health may well be advertised as public meetings. Some sessions of the other sections contain papers which are of general interest. The program of the general sessions except the oration in surgery will all be open to the public. The public meetings should also excite the interest and attendance of the wives of the members; in fact, the program of the Section on Public Health alone will furnish the women a strong incentive to attend our annual meeting, and a full list of entertainments for the women is being carefully arranged. The members are particularly urged to reserve hotel accommodations at an early date and a full list of hotels and boarding houses with their respective rates may be found on page 100. Please note that in order to get the full benefits

of this large and comprehensive program the members should arrange their affairs so that they can remain in Albany during the three days. The most interesting papers of several of the sections will be read on Thursday; in fact, it has been our purpose in arranging the program to make the Thursday sessions fully equal if not better than all others.

It will be noted that the general program covers the opening oration by Harvey W. Wiley, M.D., Chemist and Chief, Bureau of Chemistry, Department of Agriculture. One evening session at the Assembly Chamber to be addressed by George E. de Schweinitz, M.D., of Philadelphia, on Prevention of Blindness and the Instruction of the Blind Child; G. Hudson Makuen, M.D., of Philadelphia, on Prevention of Deafness and Instruction of the Deaf Child; Albert Warren Ferris, M.D., of New York City, on Prevention of Insanity, etc.; Homer Folks, Esq., State Board of Charities, New York City, on Prevention of Tuberculosis. A second evening session at the Assembly Chamber will open a subject of vast importance to the general public, namely, the "Benefits of Vivisection to Mankind," by Walter B. Cannon, M.D., Professor of Physiology, Harvard Medical School. The Annual Oration on Surgery by J. M. T. Finney, M.D., of Johns Hopkins University, Baltimore, will be delivered on Wednesday at two P. M.

Upon the various section programs appear such prominent invited guests as: Surgeon General George E. Torney, U. S. Army; Surgeon General C. F. Stokes, U. S. Navy; Emil G. Beck, M.D., Chicago; John B. Deaver, M.D., Philadelphia; Truman W. Brophy, M.D., Chicago; Major F. F. Russell, Capt. James N. Phalan, and Lieut. S. M. Shook, Medical Corps of U. S. Army; George Dock, M.D., St. Louis; William F. Braasch, M.D., Rochester, Minn.; Alfred Stengel, M.D., Philadelphia; S. Solis Cohen, M.D., Philadelphia; William Carpenter

Rosenow, M.D., Chicago. There will also be a paper from an army officer on the medical work in the Canal Zone.

It is believed that the varied and high class character of the program will create widespread interest and result in the largest attendance in our history.

WENDELL C. PHILLIPS.

NATIONAL QUARANTINE.

AT the present writing Governor Dix has not sent in the name of anyone to succeed Dr. Doty as Health Officer of the Port of New York. It is reported that the Governor has been rendered ill by the anxieties of his position. He has been assailed on every hand by the seekers for spoils. He has learned that an important public office is but the football of the politicians and that he is the goal over which the contending factions seek to kick the ball and land a touchdown for their own side. None of the candidates for Health Officer has any special qualifications for the office. It has not been shown that any of them have had special training as sanitarians or executive officers charged with the disbursement of large sums of public money.

The preëminent qualification seems to be that each man has a pull with sundry powerful politicians and needs the money. It is easy to understand the perplexity of the Governor, a well-meaning gentleman who naturally enough does not want to displace a man whom he may in all sincerity believe to have committed grave errors, if the report of Commissioner Bulger is credible, only to replace him with an appointee of whose qualifications he knows nothing. Doty's fifteen years' experience and the undeniable fact that in that long period no contagious diseases from without have ever gained a foothold on our shores make more than a six-barred fence to be taken at one leap and the Governor has not fancied the jump. He cannot help reflecting that the condemnation and the facts do not fit together. Men do not gather grapes of thorns nor figs of thistles. The Governor in his heart knows very well that Doty's record is not that of incompetence. He is equally cognizant that Doty has had the unanimous support of the entire profession of the State, without reference to party lines. No wonder he has been torn with anxiety. He is an honest and well-meaning gentleman who wishes to do what is right and the responsibilities of his position have almost crushed him. We do not now know what will be the outcome. If he continues Doty as Health Officer he discredits his own Commissioner and his own opinion. If he appoints as his successor a man who is without experience and special training and evil comes of it, the responsibility of a cholera or plague stricken community will be right up to the Governor. Meanwhile the contending factions rush the ball about a muddy field and each hopes to win.

One of the most important posts in the United

States is the prize. The Health Officer of the Port of New York stands guard at the most important gateway of the continent. The contest which has been raging in Albany for the control of this patronage concerns not only the citizens of New York City, but the citizens of the whole United States.

If cholera or the bubonic plague or epidemic cerebro-spinal meningitis once gained a foothold in the crowded tenements of our East Side, it would not be long before the health officers of widely separated communities would be busy with sporadic cases which easily might start a series of epidemics. No intelligent person will deny this. What follows? That quarantine as it concerns all the States, the nation at large, should cease to be a local affair. It is national in scope and its administration should be national and not local. The citizens of the United States ought not to be imperilled by a factional fight between petty politicians with hungry heelers to appease.

The United States Government controls our harbors in other matters. Why should it turn over so important a function as quarantine to the various States.

The spectacle of the recent contest in New York over the Health Officer and all its disgraceful and sordid details, including the preposterous and cruel persecution of Dr. Doty, furnishes an unanswerable argument for a national quarantine, perfectly administered by such trained and experienced sanitarians as are to be found in the Marine Hospital service. One thing is sure—the public health ought not to be trifled with.

THE ANTIVIVISECTION BILL.

ON page 103 of the current number of the STATE JOURNAL OF MEDICINE will be found Assembly bills 211 and 58. The Barnes bill, No. 58, calls for a commission to be appointed by the governor to investigate and report the present condition and extent of the practice of vivisection in this state. As the bill provides for a bipartisan commission it is evident that the chairman who is to be "fair and impartial" would in effect be the whole commission. This bill then aims to put it in the power of one man to make a report. We have not forgotten the Doty case and the Hon. Bulger.

The Brooks bill ought to be entitled, "A bill to hand over experimental medicine to the Society for the Prevention of Cruelty to Animals." See Section 3, "Any corporation formed under the laws of this state," etc., *et seq.*

We desire to call the attention of the medical profession to these bills and urge them to oppose them actively by interviewing their assemblymen and senators. A bill somewhat similar to the Barnes bill practically put a stop to animal experimentation in England. The demerits of the Brooks bill are sufficiently obvious.

Original Articles

REMARKS ON THE SCIENCE AND THE ART OF SURGERY AS APPLIED IN THE TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR.

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IN the December number of the JOURNAL may be found an article on the treatment of fractures in and about the thigh bone, illustrating, according to the author, the art in distinction to the science of surgery, and representing very fairly, it seems to me, a generally accepted point of view.

As the application of treatment is dependent upon the knowledge of, or perhaps better, the interpretation of the condition to be treated, I propose to analyze the writer's exposition of the art of surgery in its relation to this injury in order to present more clearly the quality of the science on which it is based, or in his own words, "the general essentials of treatment which are fairly well known."

The salient points in the paper are these:

1. The most important accessory is a proper bed, since the ordinary mattress "often becomes foul and mouldy from perspiration."

2. The technical treatment is traction by weight and pulley, which although not sufficient to overcome the shortening immediately will usually do so after an interval of several days. If, however, the inequality is due to impaction, it must on no account be reduced. The rotation of the limb is regulated by a pillow.

3. The patient's buttocks must be washed twice daily to prevent bed sores. It is "exceedingly common for patients to become delirious at the end of the first week."

Visits are to be made twice a day for a week and daily for four or five weeks, since assistants and even the best trained nurses cannot be trusted to carry out the essential details of treatment.

4. Patients are informed that there is always more or less shortening; that lameness persists in the great majority of the cases, and that in many instances a crutch or cane must be habitually used in locomotion.

The author reads to his students from the lectures of Sir Astley Cooper as follows: "It is asserted by some surgeons that these fractures unite like those occurring in other bones of the body, but I firmly believe that as a general rule, the transverse fracture of the cervix within the capsule does not unite by bone."

The writer of this paper is evidently one of those rare exceptions among surgeons who is really interested in this neglected subject and I shall assume that he is open to argument since although the abduction method "does not appeal to him," he admits that "there may be something in it."

The treatment that he describes equals in efficiency any of the conventional methods, I think, and the care that he gives his patients is quite above the average. He says that the carrying out of its details has uniformly given him satisfaction, while the patients with whom he has come to a "full understanding" are doubtless resigned to the inevitable.

How can it be expected that function can be restored if deformity is not corrected, or that a transverse fracture of the neck of the femur will unite if the only means of apposing the fragments is a traction force sufficient, perhaps, to reduce the shortening in several days, with no support other than the mattress, from which the patient must be lifted for the use of the bed pan, and twice daily for inspection of the back; and if more or less shortening is present in all cases at the termination of treatment.

If, then, the characteristic case is an aged and feeble individual, if functional recovery is impossible, if repair even is doubtful, and if treatment, from which so little is anticipated, is made tolerable only by constant personal attention, it is hardly to be wondered at if, in the words of the author, the attending physician is utterly bewildered by the problems confronting him.

Let me illustrate another side of the problem by a case seen recently. A vigorous young man "strained his hip" at tennis. He considered the injury so slight that he attempted to continue the game. For five weeks he limped about with the aid of canes, with intervals of rest for the treatment of neuritis. Finally the manipulations of an osteopath caused such discomfort that he entered a hospital, where an X-ray picture showed a complete transverse fracture of the neck of the femur, with the characteristic displacement. The physician who was first consulted was misled, doubtless, by the teaching that such fractures are practically confined to the aged, except when caused by great violence and that a broken hip can not be used to sustain weight unless, perhaps, the fragments are impacted.

Might not this case bewilder the practitioner, even though the method described were quite at his command, and more especially if he were obliged to present his prognostic formula to the young man and to his anxious relatives?

We have been taught that this fracture is an exception to all the injuries of its class. For example, exceptionally limited to advanced life because of an exceptional local atrophy; that the tissues are exceptionally incapable of repair and are subject to an exceptional "spontaneous absorption." For these reasons it may be treated exceptionally, in the sense that surgical principles may be disregarded, all of which has resulted in exceptional neglect both of the injury and of the patient who has sustained it.

How little this teaching has been modified in recent years is illustrated by the author's selection of an authority. Sir Astley Cooper was in

his prime one hundred years ago, and as he had taught thus for thirty years, it would appear that his conclusions date from the 18th century when routine treatment may have been even less efficient than at the present day.

Our exact knowledge of this injury may be formulated as follows:

It is one of a group of fractures involving joints relatively common at all periods of life, which from every point of view, presents the greatest difficulties in treatment.

If it cannot be predicted that a transverse fracture of the neck of the femur will, in a given case, unite by bone, it has at least been demonstrated that some will unite by bone. It may be assumed also that none will so unite unless contact of the fragments is assured. This is evidenced by non-union in children treated by conventional methods, although there can be no question as to the inherent capacity of the tissues for repair. Also by the fact that bony union may be attained in adult cases many months after the injury, if the fragments are freshened and apposed.

Science has been defined as knowledge gained and verified by exact observation and correct thinking; art as the skilful and systematic adaptation of means for the attainment of some desired end. The treatment of this fracture is, therefore, not scientific, since it neither represents knowledge verified by exact observation nor correct thinking. It is not artful since it is neither skilfully applied nor with any definite object in view.

It might better be defined as a form of symbolism, chosen for some supposed resemblance between it and that which it symbolizes.

I believe that the science of surgery may be best exemplified by treating this fracture like any other fracture, and its art by adapting means to the desired end, namely, reduction of deformity, apposition and fixation of the fragments.

The standard of treatment should be technical efficiency. If for any reason such treatment is impracticable, the patients should receive the consideration accorded to other inoperable cases, but at the end, not at the beginning of the chapter.

An efficient treatment may be modified in adaptation to the individual and yet serve its purpose, while an inefficient treatment must be inefficient even under the most favorable conditions.

From this point of view I propose to call attention to the abduction method in the hope of convincing the author that there is really "something in it."

Although I have described this many times, I cannot assume that its principles are familiar, since they are so often misapprehended not only by those who criticise, but by those who apply the treatment, often in a form so modified that it retains little but the saving grace of abduction.

The method is a mechanical adaptation to

the anatomy of the joint that enables one to correct deformity and to fix the fragments securely, viz., the normal inclination of the neck of the femur (120-130 degrees) permits a range of abduction at the hip of from 40 to 60 degrees, a movement that is definitely checked by contact of the upper border of the neck with the projecting rim of the acetabulum. During the movement of abduction the head of the femur glides downward until its lower third emerges from the acetabulum and distends the lower part of the capsule. At the limit of normal abduction under anaesthesia the base of the neck is in contact with the rim of the acetabulum, the tissues covering the trochanter are apposed to the tissues covering the pelvis and the capsule is tense. (Fig. 1.)

In complete fracture of the neck of the femur the limb is usually shortened, somewhat flexed, rotated outward and often slightly abducted. Thus the outer fragment is turned forward, displaced upward and usually lies on a lower plane than the head. (Fig. 3.)

As one has no control over the inner fragment, contact can be assured only by adjusting the outer fragment to it. This is accomplished as follows: The patient having been anaesthetized is lifted to a sacral support, the shoulders resting on a box of equal height, while the extended limbs are supported by two assistants. The assistant holding the uninjured limb then abducts it to the anatomical limit, to illustrate the normal range, which varies in different individuals, and incidentally to fix the pelvis by direct bony contact. The operator first flexes the thigh to disengage the fragments. The assistant then extends the limb and by manual traction overcomes the shortening, as demonstrated by the relation of the trochanter to Nélaton's line, and by measurement. He then under traction abducts it to the normal limit, the operator meanwhile lifting the thigh from beneath. Inspection should now show absolute correspondence between the extended limbs, as to abduction, rotation, length, and position of the trochanters. In this attitude the injured part is securely fixed by a plaster spica extending from the nipples to the toes.

The advantages of the abduction treatment should be obvious if one understands the mechanism of the joint:

1. In abduction the outer fragment is turned downward and inward toward the inner fragment.

2. In full abduction under traction the capsule is made tense, and being attached about each fragment this tension should align them.

3. At the limit of abduction the trochanter is brought into contact with the tissues covering the pelvis, or if the fracture is near the head, the outer fragment is engaged beneath the rim of the acetabulum, thus providing a direct check against displacement.

4. In full abduction the direction of the muscles is so changed that their contraction can no longer displace the fragments.

5. Finally, the attitude of abduction, which is directly opposed to that indicative of deformity and symptomatic of weakness, is the attitude most favorable to restoration of function when the support is removed. (Fig. 4.)



FIG. 1—The anatomical checks to abduction: a. Impact of the trochanter with the ileum (muscles intervening); b. Contact of the upper border of the neck and the rim of the acetabulum; c. Tension of the capsule.

FIG. 2—Coxa vara—illustrating the limitation of abduction caused by the loss of the normal angle between the neck and shaft.



FIG. 3—Complete fracture, showing the displacement and the adverse influence of muscular contraction.

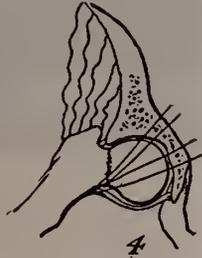


FIG. 4—Reposition by traction and abduction, showing the relaxation and change in direction of the muscles and the security of the position.

THE TREATMENT OF "IMPACTED FRACTURE."

Our author, following accepted teaching, says that the reduction of shortening due to impaction would be a serious mistake.

Impact—"to drive together, so as to form a solid mass," is the strict definition, and there are doubtless instances of such impaction caused by direct violence. Ordinarily, however, the neck of the femur is broken by indirect force, which could hardly drive one fragment into the other. What passes for impaction is a fracture in which some control over the limb is retained. In many instances the separation is complete with but slight displacement; in others there is usually some contact between the fractured surfaces although not always, as for example, in epiphyseal fracture. Incomplete fractures are relatively common in early life.

The shortening in this group of cases is usually explained by upward displacement of the trochanter in its relation to the neck. In other words, the essential deformity is loss of the upward inclination of the neck of the femur. (Fig. 2.) This deformity entails disorganization of joint function, limitation of abduction and, in

most instances, a compensatory tilting of the pelvis that exaggerates the inequality of the limbs.

For these reasons the deformity should be reduced not only to restore function, but to promote rather than to prevent, repair. If the fracture is complete the fragments may be apposed by the manipulation already described. The typical incomplete fracture, more often seen in early life, presents in the X-ray picture a coxa vara deformity in which the fragments, adherent below, are separated by a wedge-shaped interval above. (Fig. 5.) This deformity although resistant to traction even if not "carefully regulated," may be easily and safely corrected by slight leverage, as follows: As normal abduction depends upon the upward inclination of the neck, it must be limited in direct proportion to the lessened or lost angle. Thus, the range of abduction under anesthesia is checked by contact of the neck with the upper border of the acetabulum, a contact that fixes it. Now, under steady traction aided by downward pressure on the projecting trochanter, the limb is still further abducted with the aim of overcoming or lessening the deformity. In other words, the deformed neck lies in a plane representing normal abduction while the shaft is in the median line. The shaft is therefore abducted until the normal relation is restored, at least to the degree that is practicable. When this is accomplished, the outward rotation having been reduced, a plaster spica is immediately applied. (Fig. 6.)



FIG. 5—A common variety of incomplete or so-called impacted fracture, illustrating the deformity, which if uncorrected causes subsequent disability.

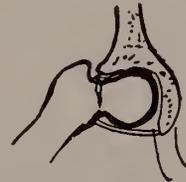


FIG. 6—Abduction closes the interval and restores the normal angle.

This method intelligently applied and modified in adaptation to the character of the injury, in which the only movements permitted are those required to reduce deformity, and in which secure fixation is assured has no relation to the "breaking up of an impaction" so deplored by the authorities.

Having used the foregoing text so liberally to illustrate conventional treatment I shall now quote from another recent paper which shows a disregard of surgical principles from the positive as well as from the negative standpoint. (F. J. Cotton, *Bost. Med. and Surg. Journal*, Dec. 7, 1911, also *Dislocations and Joint Fractures*, by the same author, 1910.)

This writer makes two statements that certainly indicate a divergence from the prevailing opinion.

1. "The majority of hip fractures are impacted."

2. "Union usually occurs in fractures originally unimpacted, by the use of the abduction treatment."

"If the fracture is impacted in tolerably good position, it is a crime to disturb it. If the position is very bad, *e. g.*, if the outward rotation is extreme, we may in selected cases, break up the impaction and then reimpact or we may put the limb up in abduction after breaking up the impaction."

This quotation shows how completely function, the first consideration in the treatment of other fractures, is disregarded. If a tolerably good position assures a tolerably satisfactory range of motion I should agree with the writer. But extreme outward rotation is apparently the one indication for disturbing the impaction. Such outward rotation may indicate complete separation of the fractured surfaces, as in epiphyseal separation and in the somewhat similar type of injury in older subjects, the fragments being adherent or entangled, but not impacted. Outward rotation, considered merely as a deformity, is, however, of minor consequence as compared with the loss of the femoral angle on which abduction depends.

He fails also to appreciate the fact that the abduction method is in itself the best means of correcting the deformity, fixation in abduction being but the final step in the process.

Reimpaction, the alternative to abduction, is induced by "driving home the trochanter, protected by felt of course, with a heavy mallet." The author predicts that the time is coming "when in these and perhaps in all unimpacted fractures it may seem wise to produce such impaction." He has reported one successful case.

It seems to me that his reasoning is defective, admitting that his observations on the relative frequency of impacted and unimpacted fractures can be confirmed. If a fracture is, by the original force of the injury, firmly impacted, the blood supply on which repair depends should be relatively competent as compared to complete fracture in which the tissues have been injured by the displacement. If, however, such impaction is "broken up" or when separated surfaces are brought together, secondary impaction, assuming that it were generally successful, which is to say the least doubtful, could only assure contact. The contusion of the bony structure incident to the procedure, like contusion of other tissues must retard rather than aid repair.

If it be a crime to reduce the deformity of a so-called impacted fracture of the indeter-

minate class, in which the position is not "tolerably good" nor yet "very bad," in the manner that has been described, neither I nor my patients have as yet suffered its consequences. Indeed, in view of the pitiable effects of neglect and inertia, so familiar to us all, I might retort with a quotation from an unscientific source "not failure but low aim is crime."

Fixation of the apposed fragments by posterior support is absolutely essential. One should be able therefore to apply a comfortable and efficient plaster spica, since this is the only form of support at immediate command. (Fig. 7.)



FIG. 7.—The plaster spica holding the limb at the limit of normal abduction, illustrating the adjustment to the pelvis and to the hip.

It is often remarked by those who appreciate the technical advantages of the abduction method, that it should be reserved for the younger patients. I believe, on the contrary, that it is the safest as well as the most efficient treatment for all cases in which any local treatment is practicable. Pain is immediately relieved, and the patient may be moved about without discomfort, thus bedsores are not to be feared, nor does the mattress ever become "foul and mouldy from perspiration." The head of the bed may be raised to any degree to prevent hypostatic congestion of the lungs, an inclination that is impracticable when traction is employed. (Fig. 8.)

It must be admitted that skill and experience are desirable, and that more effort is required in the application of the abduction method than is usually expended on these neglected cases. There is, however, this compensation, that the entire treatment is under the surgeon's control, nor is the constant attention, so necessary we are told to make conventional treatment tolerable, required. There is still another advantage in efficient treatment, aside from personal satisfaction in good workmanship. One may at least conscientiously hold out the hope of success as a reward for constraint and confinement, a moral support both for the surgeon and for the patient which is not generally appreciated.



FIG. 8—The elevation of the head of the bed (25 deg.) to provide a semi-reclining posture and thus to lessen the danger of thoracic congestion and to improve the nutrition of the injured part. Age of the patient 73 years. Union obtained.

The possibility of functional cure leads to the consideration of the after treatment, which is not mentioned by our author. It may be assumed that repair, especially of the transverse fracture, proceeds very slowly and from the interior of the bone rather than by external callus. Consequently, not only is accurate apposition of the fractured surfaces essential, but the weak part must be protected for an indefinite time. No weight should be supported for at least six months, nor until freedom of movement and muscular control indicate that repair is complete. A modified hip splint to permit locomotion without weight bearing is therefore a very useful accessory in treatment. Under present conditions the early use of the limb is not only permitted but encouraged "to aid repair" or perhaps to accustom the patient the sooner to inevitable disability.*

The analysis of conventional methods indicates ineffectiveness in every particular, yet the results of such treatment have been accepted as reliable evidence that this fracture is an exception to the other injuries of its class in that surgical methods, if not inapplicable are at least unavailing.

I have disregarded authoritative teaching, not from negative reasoning only, but because I have had the great advantage of approaching the subject from a new point of view, in the treatment of children, a class unknown to Sir Astley Cooper.

Among these patients one finds the same penalties for neglect that are supposed to be

* "I never feel safe in allowing weight bearing before eight or ten weeks, and then only cautiously."—Cotton locus cit.

inevitable in advanced life, namely, deformity, distortion, non union and even "spontaneous absorption." Yet functional cure is the rule under efficient treatment.

It is fair to assume, therefore, in the absence of positive evidence to the contrary, that the same results, at least in relative degree, may be attained by the same treatment in older subjects; and in fact this has long since been proved by the experience of the surgeons who have adopted the abduction method.

When the opportunity for repair has been assured in a sufficient number of cases the results will enable us to estimate the proportion of fact and fancy in the statements that have gained authority by constant repetition. But in the absence of such evidence we should at least attempt to treat our patients in a manner that may deserve success, since only experience can prove that it is ever unattainable.

I think that I am justified in the statement that the abduction method is based on surgical principles. Applied under favorable conditions, regulated and verified by X-ray examinations, before, during and after the operation, with the fragments securely fixed by a comfortable support, it exemplifies an adaptation of available means to a desired end. This basic treatment must be supplemented by open operation if the fragments are so displaced as to be irreducible by the ordinary manipulation, or to freshen and appose them in cases of non union. It includes also, beside protection, such reconstructive measures as may be indicated during the long period of repair.

In this comprehensive sense the abduction treatment fulfills, in my opinion, the requirements of science and of art as they have been defined.

THE INDISPENSABLENESS OF ANIMAL EXPERIMENTATION AND THE IMMORALITY AND CRUELTY OF ANTI-VIVISECTION.*

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VIVISECTION A MISNOMER.

AT the very outset I will say that I object very strongly to the name vivisection, because the name is false, and in spite of being false is the chief asset of the antivivisectionists. What's in a name? Very much. It has always been my opinion that a great part of opposition to animal experimentation is due to the name, vivisection. Vivisection means dissecting or cutting up alive. This instantly calls up an unpleasant, a painful picture. As a matter of fact, the name is a misnomer. Out of a thousand experiments performed on animals nowadays there is barely one or two that require the cutting

* Read before the Brooklyn Philosophical Association, on January 14, in a debate with Wm. R. Bradshaw of the Antivivisection Society.

up of the living animal; where it is necessary it is done generally under anesthesia, and the animal is killed before it comes out of the anesthetic, so that at no time does it feel any pain. Most of the experiments performed nowadays consist in hypodermic or intravenous injections, in venesection, in a study of the processes of metabolism etc., and the name vivisection should be discarded. We should use the term animal experimentation, or if one word be desired I would suggest the term vivixperimentation. That means experimenting with living beings, and expresses just what it should express.

ANTIVIVISECTION IRRATIONAL.

Is vivisection or animal experimentation immoral and unscientific? The antivivisectionists say it is. It is my task this afternoon to show you, to prove to you, the contrary. I shall prove that not only is vivisection not immoral and not unscientific, but that it is both moral and highly scientific. I shall do more than that. I shall prove that it is indispensable. I shall prove that without vivisection or animal experimentation progress in medicine in its broader sense, *i. e.*, any further progress in the prevention, alleviation and cure of disease and prolongation of human life, would become impossible. I shall prove that many or some of you that are here today would perhaps be resting in your graves, if not for animal experimentation. If I succeed in proving this beyond any doubt, cavil, question, or dispute, then it will become clearly apparent that antivivisection is immoral, irrational, cruel and unscientific. For you will agree that these are the only terms we can apply to a movement which has for its object the hindrance of any progress in the prevention and cure of disease and the prolongation of human life.

In every discussion, in every debate certain basic principles must be agreed upon, certain terms must be defined, explained and borne in mind. Otherwise the discussion is a waste of time, no satisfactory conclusion can be arrived at, confusion becomes more confused, chaos more chaotic.

And so in this discussion, if I succeed in proving to your satisfaction that thousands and thousands of human lives are saved annually as a result of vivisection or animal experimentation, if I prove that without vivisection further progress in medicine is impossible, I shall consider that I have proved my points satisfactorily. For with the person who maintains that even if experimentation *does* save tens of thousands of human lives, it is nevertheless immoral, I have nothing to do; I have nothing to say to such a person. Such a person is in my opinion an irrational being, and is outside the pale of rational discussion. We would never understand each other and all argument would be worse than waste of time and effort. Nor will I address myself to those antivivisectionists who are meat eaters and who wear

skins and furs of animals and the feathers of birds. For people who will object to experimentation on animals under anesthesia for the purpose of curing disease and will not object to the brutal killing of animals by the hammer, knife or bullet for the purpose of satisfying their appetite or their vanity are beneath contempt. They are so muddled in their heads and in their hearts that they are not worth arguing with.

MEANING OF THE WORDS MORAL AND IMMORAL.

As to the meaning of the words moral and immoral, my definitions of those words are very simple: Everything that contributes to the health, welfare and happiness of the human race is *moral*, everything that hinders the health, welfare and happiness of the human race, or that contributes to the ill-health, misery and unhappiness of the human race, is *immoral*. And if we accept those definitions, I will have no difficulty in proving that vivisection or vivixperimentation is moral, and antivivisection immoral.

THE REMARKABLE REDUCTION OF THE MORTALITY IN DIPHTHERIA.

I could take a dozen diseases, the mortality rate of which has decreased within the last few years as a direct result of animal experimentation, but two or three will suffice. I will take the diseases about which there can be no dispute, no discussion. One *must* admit that their mortality has decreased enormously, unless one wants to lie deliberately.

We all remember what a sickening terror the word diphtheria used to send into the hearts of mothers, fathers and every other member of the household. We physicians who practiced say twenty years ago, remember with what tense anguish and anxiety the mothers used to watch our faces while we were examining a child's throat, and hang on our lips to hear the diagnosis. "What is it, doctor, is it just a sore throat, or is it diphtheria?" And the expressions on their faces were pitiful to behold when the truth compelled us to say diphtheria. For diphtheria at that time was a terrible disease, and only too frequently did it mean a visit from the angel of death. No wonder the name of that disease used to strike terror into the hearts of mothers of men. Now the name of the disease has a much milder sound, not because the disease is milder, but because we have a much more effective method of treating it, so that the mortality rate of today is much lower than it was formerly. That more effective method of treating diphtheria consists in the employment of anti-diphtheritic serum, commonly known as antitoxin. In the discovery of antitoxin a greater advance was made in medicine than was made in a thousand years previously. And this beneficent discovery, which saves every year tens of thousands of little tots from the jaws of grim death, would have been absolutely impossible without animal experimentation.

But perhaps I am going too fast. I have asserted that the mortality rate from diphtheria is much lower than it was, but I have not proved it yet. Of course we all have the general impression that it is so, but general impressions are dangerous things. In all my writings and addresses I preach against depending on general impressions as arguments in scientific discussions. In scientific discussions we want facts, definite, unassailable, incontrovertible facts. And I will give you facts which only the hopelessly strabismic, the viciously pervert will dare to question or assail. And I am not going to take the statistics of one or two years; for in this case our opponents could object—though without any proof—that the reason the mortality rate was lower is because the disease was of a milder type. But when we see the mortality rate under antitoxin diminishing year after year, when we compare a period of ten or fifteen years of the pre-antitoxin days, then we cannot help being convinced that the discoverers of antitoxin are among humanity's great benefactors.

INCONTROVERTIBLE STATISTICS.

Here are some of the statistics:

We will take New York just thirty years ago, namely the year 1881; that was a bad year and the deaths from diphtheria per 100,000 were 264; do you know what the deaths per 100,000 were the year that has just closed, namely 1911? Twenty-eight! (or to be exact 28 and a half). Just think of that terrible difference—264 thirty years ago, and 28 now! Immediately with the introduction of antitoxin there was a diminution in the death rate, in spite of the fact that the antitoxin was not as pure and concentrated as it is now, and we were not so familiar with the dosage to be used, etc. In 1894 the deaths per 100,000 numbered 158; in 1895, the year of the introduction of antitoxin, the number fell to 105; and from that time on the fall has been almost constant and steady. In 1896 the deaths per 100,000 were 91; in 1897, 81; in 1898, 96; in 1899, 53; in 1900, 62; in 1901, 58; in 1902, 53; in 1903, 56; in 1904, 57; in 1905, 38; in 1906, 39; in 1907, 40; in 1908, 41; in 1909, 39; in 1910, 37; and in 1911, as I have already mentioned, 28.5! In other words, the mortality from diphtheria in New York since the introduction of antitoxin has been diminished 80 per cent., or reduced to about one-fifth of what it was! In other words, the introduction of antitoxin saved in New York City alone the lives of about 50,000 children, some of whom are perhaps in this hall now, and who without antitoxin would now be in their little graves.

In Chicago we have the same results. For the fourteen years prior to the introduction of antitoxin, the average mortality per 100,000 was 136; in the fourteen years subsequent to the introduction of antitoxin, the average mortality per annum per 100,000 was just 36! A reduction of 73 per cent.!

In order to show that this general reduction of the mortality of diphtheria has been universal throughout the world, I will present a table which gives the combined statistics of deaths and death-rates from diphtheria and croup (*i. e.*, laryngeal diphtheria) in New York, Brooklyn, Boston, Pittsburgh, Baltimore, Philadelphia, Berlin, Cologne, Breslau, Dresden, Hamburg, Konigsberg, Munich, Vienna, London, Glasgow, Liverpool, Paris, Frankfurt, for the five years prior to the introduction of antitoxin and the ten years subsequent to its introduction:

Year.	Population.	Deaths from Diphtheria and Croup.	Deaths per 100,000
1890	16,526,135	11,059	66.9
1891	17,689,146	12,389	70.0
1892	18,330,737	14,200	77.5
1893	18,467,970	15,726	80.4
1894	19,033,902	15,125	79.9
*1895	19,143,188	10,657	55.6
1896	19,489,682	9,651	49.5
1897	19,800,629	8,942	45.2
1898	20,037,918	7,170	35.7
1899	20,358,857	7,256	35.6
1900	20,764,614	6,791	32.7
1901	20,874,572	6,104	29.2
1902	21,552,398	5,630	26.1
1903	21,865,299	5,117	23.4
1904	22,532,848	4,917	21.8
1905	22,790,000	4,323	19.0

In other words, in these various cities, situated in various climates, in various portions of the globe, with the people living under various social and economic conditions, we have a gradual fall from 66.9 to 19!

TRACHEOTOMY AND INTUBATION NOW SELDOM PERFORMED.

Dare any one still doubt the potency of antitoxin? An additional proof, if additional proof be needed, of the beneficent life-saving effect of antitoxin will be found in the following facts, which will be corroborated by any physician of any experience: In the pre-antitoxin days, the diphtheritic membrane would often spread and extend into the child's larynx and windpipe, and the child would then choke, choke as horribly and painfully as if you pushed a handkerchief down, or as if you took it by the throat and strangled it. The labored breathing, the ashen face, the glassy eyes—it was a most painful sight to witness, and the physician who was unfortunate enough to have many cases of laryngeal diphtheria or true diphtheritic croup, will not forget these scenes to the end of his days. The only chance there was to save the child from certain and often immediate strangling was to perform the operation of tracheotomy; that is, cutting open the trachea and inserting a silver tube,

* Introduction of antitoxin treatment.

through which the patient could breathe; but the percentage of recoveries after this operation was not very great. A New York physician, Dr. O'Dwyer, then perfected a set of tubes of different sizes, according to the children's different ages; and one of these would be inserted in the larynx, and through it the little patient would be enabled to breathe until recovery or death. This method of intubation, as it is called, did save many lives and became a well recognized procedure. Courses on intubation were given in the various post-graduate colleges and hospitals, and some physicians who were particularly skilful in intubating children made a kind of specialty of it, which added considerably to their income. I know personally a number of such specialists. Now no courses on intubation are given in the colleges, the intubation specialists have not had a case to intubate in years, and their intubation sets are resting and rusting in their leather cases. One of the most dextrous of the intubation specialists told me that he hoped he would never be called again to intubate a child, because he feared he would not know how to do it. Why is this so? Because antitoxin, if administered early, as it always should be, cuts the disease short, makes the membrane disappear from the throat and thus prevents its extension into the larynx and windpipe.

And without animal experimentation, I emphasize, there would have been no antitoxin. For the discovery of the diphtheria bacillus, which was the first step in the discovery of antitoxin, and the discovery of the antitoxin itself were the direct results of animal experimentation, and the production of antitoxin cannot be accomplished without animals, without some slight discomfort to the poor horses.

THE DISCOVERY OF SALVARSAN OR 606.

We will now take a disease which has caused untold misery to humanity for several centuries; a disease which in its protean and universal manifestation has no equal; a disease which is present in every clime and mows down its victims in every season; a disease which attacks every organ and tissue in the body from the least important, as the hair and finger nails, to the most important, as the heart and brain; a disease which spares neither king nor peasant, neither multimillionaire nor wage-slave; a disease which inflicts its horrors on the so-called guilty and innocent alike; a disease which is responsible for more physical degeneration, more insanity, more idiocy and feeble-mindedness, more invalid and disfigured wives, more barren marriages, more involuntary abortions, more stillbirths, more puny children that die in early infancy or grow up to curse the day they were born; a disease, in short, which more than any other disease is a menace to both the individual and the race. You have guessed of course by this time that I am referring to syphilis, a dis-

ease the name of which up to four or five years ago could not be pronounced before a lay audience, in spite of the terrible havoc it was working among the human race.

Well, we have learned more about this disease in the last six years than in the previous six hundred years. Up to six years ago we did not know the cause of syphilis, we did not have a definite scientific test for its diagnosis, and we did not have any remedy which could, under favorable circumstances, destroy all the spirochetæ at one blow. Within the last six years we discovered definitely and positively the germ that causes syphilis, namely the *spirochæta pallida*; we discovered a test by which we can say whether the disease is still present in a person's blood or not, the Wassermann reaction; and we discovered a potent drug which has a most powerful effect on the germ of syphilis and on the manifestations of the disease, namely Ehrlich's 606 or salvarsan. And with these three discoveries syphilis has lost for us much of its old-time terror, and is much more amenable to treatment than it was formerly. Many cases of syphilis which were refractory to mercury, now respond to treatment by salvarsan alone or the combined treatment by salvarsan and mercury. It is impossible to estimate how much sickness is being prevented or curtailed by these discoveries. And what has made these discoveries possible? Nothing but animal experimentation. Without the latter they would have been *absolutely* impossible.

And if those who ignorantly or stupidly jeer at and malign the animal experimenters knew them more closely, knew how unselfishly devoted they are to their ideals, which are the furtherance of knowledge and the saving of human health and life, knew how unremittingly, how unceasingly they toil day and night—and this is not merely a figure of speech, but the truth, for very often in the midst of an experiment they will pass the entire night without sleep, watching the animals, etc.—in the attempt to wring from nature her closely guarded secrets, and all this for a pitiful financial reward, they would be so heartily ashamed of themselves that they would do penance and wear sackcloth and ashes for the rest of their lives; perhaps some of them, in utter disgust at their baseless and vicious slanders, would commit hari-kari.

The temptation is very great to spend some time on the subject of malaria and yellow fever. To show you how by patient, painstaking experiments in which the doctors themselves offered themselves as subjects for the experiments, the real causes of malaria and yellow fever were discovered: and how hundreds of thousands of acres of land uninhabitable before became not only inhabitable but sanitary places of abode. I should like to refer to the Panama zone, which was so deadly that when people used to go there they generally used to make out their wills be-

forehand and which has now the mortality rate of a summer resort. I should like to devote some time to show you how, through experiments on animals, we are now able to perform some of the most delicate operations on human beings, and that but for the experiments on animals we would have to get our experience on you—which you certainly would not like. I should like to refer to the wonderful achievements we are making, as a result of animal experimentation, in the transplantation of organs from one animal to another. But the time is short, the subject is too large to be covered in one lecture anyway, and therefore instead of telling what we have achieved I will pass to a disease in which everything remains to be achieved.

THE TERRIBLE DISEASE CANCER.

Let us take a disease which is still baffling us and which still claims a horrible toll in sickness, pain and death.

It is just as well to state plainly and clearly, so that everyone may hear it and understand it, that empiricism has reached its limits. We can no longer expect to make progress by guessing, by experimenting with unknown drugs on healthy or sick people. By a lucky accident we may once in a great, great while discover some valuable drug or some new properties in an old drug, but we cannot expect to make progress that way. If we wish to make progress in chemistry, electricity, physics, in any of the industrial arts, we do not wait for chances or accidents. We try, we try, we try, and we experiment, experiment, and experiment again. The wonderful progress in the sciences, the progress that is so rapid that it is becoming hard to keep pace with it, is due to one thing: experiment. And we have come to the recognition of the fact that if we wish to make progress in medicine we must use the same means that we use in all other sciences: namely, experiment. And as we cannot experiment with unknown substances or untried procedures on human beings, we are forced to reproduce the diseased conditions as well as we can in animals, and experiment with them.

Let us illustrate by the tragic example of cancer. In pain and sorrow we are constrained to admit that we have no internal cure for cancer, even no palliative. We have no drug, no chemical which when given internally will in any way influence the course of true cancer for better or for worse. And I will say here that whoever advertises or tells you that he can cure cancer by some internal remedies, by some medicine taken through the mouth or dropped into the eye (there is a wretched fraud who makes such a claim), or rubbed into the skin, is a knave, a swindler, and a liar. Of all the quacks the cancer quacks are the most heartless, the most conscienceless, the most wretched; they are the lowest scoundrels in all quackdom. They work on the sufferings, depression, misery and hopelessness of

the most pitiable of victims, to extract the last cent from them.

In some superficial cancers caustic pastes, the Roentgen rays, radium, Coley's fluid, etc., are of some service, but the knife is still the best means at our disposal; but it is not a satisfactory or radical remedy, for recurrences are frequent, and the cancer becomes metastatic in different parts of the body, and then nothing can be done for the patient. While in internal cancers, like that of the womb, stomach, etc., the only recourse we can have is to the knife, and that as a rule means only a temporary prolongation of life.

So what shall we do? Shall we fold our arms, bow our heads, admit our helplessness and do nothing? Not as long as we are rational human beings, with a burning, unquenchable desire for knowledge, with pity and sympathy for human suffering. We have wrested many secrets from nature which it was thought would remain buried forever in the deepest recesses of her womb, and we shall yet have the secret of the causation, the prevention and the cure of cancer. Hundreds of workers throughout the world, here in this country, in Germany, in France, in Italy, in Japan even, are devoting their lives to the unraveling of the cancer mystery, and to the discovery of a cure for this terrible malady. And in this investigation tens of thousands of mice are being shamelessly sacrificed. Yes, weep bitter tears, my antivivisection friends, for in the search for a remedy for cancer tens of thousands of poor little mousies, white and black and brown, but chiefly white, are inoculated with cancer and then various remedies are tried on them. Some of the remedies kill the poor mice, while some make the cancerous tumors disappear, and the mice get well. Only a week ago the cables brought the news of a new compound, experimented on by Wassermann, which gave very good results in mouse cancer. In many cases the tumors disappeared completely. Of course the remedy has still to be tried on human cancer, and while we have to be careful in drawing conclusions from lower animals to human beings, and while we have to be very skeptical about the announcement of new cancer cures, still when a man of Prof. Wassermann's standing and achievements—it is the same Prof. Wassermann who elaborated the very complex serum test for syphilis—reports progress, it behooves us all to listen with respectful attention. He does not go with papers before medical societies or rush into print unless he has something to say that is worth while.

And by the way, speaking of mice reminds me that only yesterday's papers (January 6) brought the news of the death of Prof. Simon of Zurich, a son-in-law of the famous Socialist August Bebel, who was bitten by a mouse on whom he experimented, and thus got blood poison. Our unbalanced antivivisectionists will see in this death of a hard-working scientist a kind of poetic justice. In my eyes, Prof. Simon's

name should be engraved on the roll of immortal martyrs, martyrs to science and the health and happiness of humanity. We have now quite a long list of such martyrs.

ARE THE ANIMAL EXPERIMENTERS CRUEL?

The antivivisectionists accuse the animal experimenters and their sympathizers of cruelty, brutality, and lack of sensibility. All we can do with such an accusation is to brand it as a cruel slander. The vivisectionists I know are gentle, tender, sensitive, and refined men, who would no more think of inflicting unnecessarily the least pain on any living creature than they would think of getting into a street brawl with some drunken loafer. One is as foreign to their nature as the other. Whenever and wherever pain can be avoided by the administration of anesthetics, it is done invariably; if it cannot, the experiment is performed as mercifully as possible; and always with one object in view—the advancement of knowledge and consequently the prevention and cure of disease, the alleviation of pain, the prolongation of human life.

I do not know whether or not you are interested in my personality; but I can assure you that in spite of my strenuous defense of vivisection, I am as strenuously opposed to cruelty to animals as any zoophilist can be. Needless pain inflicted upon any of the higher animals will quickly bring tears to my eyes. We have a little female yellow dog whom we took into our house because nobody else wanted her; she is a silly dog, but full of affection. Her intrinsic value is five cents, but we would not take five thousand dollars for her if somebody wanted to subject her to useless cruelties or harsh treatment. But if it came to the point of saving a human life, or even to the solving of an important scientific question, I would sacrifice our poor, good Nina without any hesitation. And that is where the difference comes in between the rational lover of animals and the man or woman afflicted with the zoophil psychosis. We love animals and pity them and are kind to them, but we recognize that at all times a human life is immeasurably more important than the life of an animal. We say: A thousand frogs or mice or rabbits or guinea pigs or cats or even dogs in order to save the life of one man, woman, or child! while the neurotic, hysteric antiexperimentalists say: What care we for men, women, or children; let them go to damnation—only leave our dumb animals alone.

INGERSOLL AND BERNARD SHAW.

My antivivisectionist friends often throw at me the names of Ingersoll and Bernard Shaw. Here, they say, are men whom you like and respect and not infrequently quote. You certainly cannot call them stupid and uneducated; and still, look how opposed those men are to vivisection. Well, my friends, this simply shows,

what I said so many times before, that a man may be very great in one line of human activity and very small, very stupid in another line. A man may be a great freethinker and a very poor political economist; a man may be a great surgeon or even bacteriologist and as superstitious as a sailor in matters of religion; a man may be a great financier, a shrewd and hard-headed business man, and as full of superstition as a Southern darkey; a man may be a great dramatist and be utterly silly in questions of pure science. Why, in this country we even have a successful dramatist, Mr. Charles Klein, who publicly places himself in the class of brainless imbeciles by confessing that he is a follower of and believer in that cult of fraud and idiocy miscalled *Christian Science*. Yes, we have peculiar combinations, in this country particularly. For instance, we have freethinkers, Socialists and Anarchists, people who are supposed to be able to think rationally and critically, but who on the subject of medicine, say, are on a par with the most ignorant darkey washerwoman; for they print the worst quack advertisements in their papers, consume quack patent medicines, and go for treatment to the commonest and most vulgar charlatans, the most impudent quacks and ignoramuses.

So you see, because a man is eminent in one department of human thought or activity it does not follow that his opinion is of any value in another line of human activity which is entirely foreign to him. Nobody is more fully aware than I am of the great services to humanity, to human free thought, rendered by Robert Ingersoll and Bernard Shaw; but when it comes to their opinion on vivisection, it is of no more value than would be the opinion of a street-sweeper. Neither the great Ingersoll nor the clever Bernard Shaw had a scientific training; neither of them understood the principles underlying modern scientific research, and neither has had a right to pronounce an opinion on the subject. Bernard Shaw has never handled a microscope, has never watched the life cycles of the bacteria and protozoa, has no idea of the whole theory of vaccines and antitoxins; and therefore, I repeat, his opinion on the subject of vivisection is of no more value than that of a shoemaker, a carpenter or a policeman. Writing drama does not give one the right to discuss highly complex biologic questions, no more than it makes one an authority on questions of astronomy, geology or shipbuilding. I hope that after this explanation the names of Ingersoll and Shaw will no longer be thrown in my face.

CONCLUSION.

I do not think I need bother now considering the "immorality" of animal experimentation. Having proved that vivisection is responsible for the saving of thousands of human lives, and having taken for granted the premise that whatever contributes to human health and

the conservation of human life is moral, it follows that vivexperimentation is moral.

As to the assertion or charge that vivexperimentation is unscientific, I need bother still less. We judge things by their fruits. And if animal experimentation, within the short time of its application, has given such magnificent, tangible, practical results, what else can we ask?

And besides, what right have the antivivisectionists to accuse us of being unscientific? What do they know about science? What do they know as to what is scientific and what is unscientific? What do men completely ignorant of physiology, pathology and bacteriology, men who never saw a bacterium or handled a microscope or a microtome, or any chemical or physical apparatus, know about science?

No, vivisection is neither immoral, nor unscientific; it is antivivisection that is both. It is more; it is irrational, it is cruel, it is inhuman. And we cannot help the conclusion that there is something radically wrong with people, wrong mentally and morally, who will pour out their sympathies to cats, dogs, rats, mice, frogs and mosquitoes and will withhold them from men, women, and children.

THE HEALTH OFFICER AND THE LABORATORY IN RELATION TO PUBLIC SANITATION.*

By CHARLES STOVER, M.D.,
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THERE is almost nothing within reason, that may not be done by a health board, so ample have been the powers entrusted to it by legislation. Therefore, if sanitation is not advanced, if progress is slow, there must be some fault in the administration of this body so liberally endowed with legal resources for its efficiency. It may be said that in our democracy a health board must wait upon public opinion to give it moral force, but the very essence of the construction of a health board is that it shall blaze the way, and always be in advance of the public appreciation of what is needed for the general welfare. The educational and missionary work that is peculiar to public sanitation never ceases.

The personality of the health officer very much determines the efficiency of a board of health. The ideal relation of this official is that of an executive, who because of superior knowledge, not only applies the laws of the sanitary code, but also advises the members of the board and is an incarnation of the spirit of progressive sanitation, constantly seeking to eliminate the conditions that are hostile to life and its enjoyment. Just here is where the present system is weak. The law requires that the health officer shall be

a physician, but save in the cities of the first and second classes, sufficient compensation is not rendered to secure the services of a man who can afford to devote the time necessary for the work involved. The practice of medicine has the first call, and the public service the second. This is no reproach to the doctor, it is a reflection, however, upon the system by which he is appointed. Another just criticism is that, should the physician under the foregoing conditions, by special industry and self-sacrifice come to be effective as a health officer, the whirligig of politics goes round and he is flung out of office just at the time when his experience has made him valuable, and when his carefully laid plans are about to mature. Could any policy be more stupid? This instability of office attaches to almost any political position, and perhaps is not to be eliminated, except by the incumbent making himself so useful that his services are indispensable, and it goes without saying that it may be as necessary to get rid of a faithless servant as it is to secure a worthy one. The despicable thing about it is, that because one by doing his duty and serving the public interests has antagonized an individual with a political pull, he may suddenly find himself obliged to fritter away his time by fighting back, or tamely lie down and be trampled under. To a man whose hours are already too few such a contest is not inspiring, and the prize is not worth the struggle. But there is another aspect to this situation, and that is that the work to be done for the protection of the public health is too great to be subordinate to another vocation. The work heretofore done, and now being done, is no standard to go by. It is still too much the fashion to wait for disease and danger to show themselves before invoking sanitary measures. The immense labor to be done for the prevention of disease is staggering; we have only reached the fringe of it. To make progress it is necessary that skilled direction be given to the health boards that are empowered to act. Technical problems are presented that call for more than medical training for their solution. Specialization is necessary. To this end the state has established courses of instruction for health officers. The oldest medical school in the United States offers physicians a course of postgraduate study in sanitation, completed in one year and leading up to the degree of certified sanitarian. This movement is but the beginning in the evolution of a sanitarian who shall devote himself exclusively to public work, and be given a salary to make him independent of medical practice.

Another embarrassment to sound sanitation arises from the absence of laboratory aids, more especially in rural communities, villages and smaller cities. The control of contagious diseases may be likened to the control of a fire. In proportion to the promptness with which it may be located is the successful stamping out of

* Read at the annual meeting of the Fourth District Branch of the Medical Society of the State of New York, at Ogdensburg, October 10, 1911.

either one accomplished. But in relation to these diseases, so widely different are the outbreaks, a differential diagnosis must be made to intelligently combat them. It is at once evident that the equipment of any agency to effect this result involves an expense to the smaller units of the population to make it prohibitive, and therefore the establishment of county laboratories has been provided for by the legislature, and in some localities they have been already inaugurated.

Now, what can be accomplished by the combination of the certified sanitarian and the county laboratory? In the first place, they would give to the health officers an authoritative backing that would be of value in the face of opposition, and everybody knows how much the official spine needs this brace. The laboratory would be a clearing-house for the physicians, the dairymen, the grocers, the butchers, the laborer, the dweller in city and country whose person or property might be endangered or dangerous. Here the milk supply could be checked up and put under the supervision of the authorities. Here a prompt report upon a throat specimen might lead to the early use of antitoxin, and the saving of life; or the examination of sputum fix the diagnosis of tuberculosis and bring it the sooner under private or public control. Here should be applied the educational efforts to teach the people personal and domestic hygiene, to direct the energies of the municipality, to lessen the dust of streets and the smoke of the air, to protect its public water supply, to cease polluting the rivers of the state with its sewage, to check the crowding of the immigrant classes by the enforcement of tenement house laws, to guard the health of the children in public schools, to supervise the markets that the food laws shall be rigidly observed; to oblige industrial establishments to give every workman pure air, sunlight, and reasonable time to eat a noon-day meal, retiring rooms with sanitary toilets under intelligent supervision, adequate protection of life and limb by safety devices, and the exclusion of child-labor. It will go further and secure protection from disease for the traveler on street, in trolley or steam car by the banishment of the public drinking cup, by the frequent cleaning of car floors and toilets. It will also reach out to the farm, and open up the closed book of rural hygiene to prolong and make more joyous the farmer's life, and it will see to it that while public opinion calls for the erection of contagious disease hospitals for the control of smallpox with a mortality of but seven in the state of New York, it will demand equal consideration for pulmonary tuberculosis with its awful mortality of 14,047 victims.

Related to this is the problem confronting the physician, outside of the larger cities more especially, who appreciates in full measure the value of laboratory methods, but who thus far has not been able successfully to apply them to

his daily work. No matter how well personally he may be fitted to carry on this work, the exacting demands of the practice of his profession prevent it. The laboratory in connection with the small local hospital, dependent upon the recent graduate for its direction, has failed to be of much value; the expense of a trained bacteriologist is too much to be assumed by the physician or the hospital. Here again the public will be directly benefited. How much ought a county to appropriate for carrying on such an enterprise? But before answering that question let us consider what are the losses at present suffered by our neglect to provide the protection against ordinary, every-day disease. Because we happen to be in St. Lawrence county today, let us use the mortality reports and see what typhoid fever cost this county in 1910. Twenty deaths were reported. Had these lives been spared, applying the estimate of Dr. H. M. Biggs, they would have been productive enough probably to have had a value of \$1,500 each. This multiplied by 20 equals \$30,000. It is a fair estimate that the average illness was 21 days; that their services were worth \$1 per day, and that the expenses of medical and nursing services, medicine, etc. were not less than \$1.50 per day. Multiply 21 by \$2.50 and you have \$52.50, representing the individual expense, which again multiplied by 20 gives the cost of illness: namely, \$1,050. Add this to the \$30,000, and the sum of \$31,050 represents the toll of death by typhoid. But that is not all the cost, for there probably were for each death six that recovered. If these 120 were ill only 21 days, the expense, calculated as above, would amount to \$6,300 which swells the money loss in one county by typhoid fever to \$39,350.

If a similar calculation were made upon the death rate from pulmonary tuberculosis in the same county, the 69 deaths, assuming that they were each unable to work for nine months, would represent a loss to that county of \$150,075. Now here are two diseases that have robbed a single county of values figured at \$189,425.50. Will any one say, inasmuch as infectious and contagious diseases are preventable, that the poorest county in the state cannot afford to found and support liberally a laboratory with the proper equipment and skilled direction? The truth is that the public does not rightly value human life, nor properly estimate the frightful inroads upon our national wealth made by the annual toll of death due to ignorance, neglect, and "man's inhumanity to man."

The county or municipal laboratory, with its bacteriologist and the specialized health officer, or certified sanitarian, or sanitary engineer, by whatever name he may be called, may be made powerful agencies to lessen this tremendous loss of the nation's vitality caused by preventable disease.

THE RELATIONS OF A HEALTH OFFICER TO THE MEDICAL PROFESSION AND TO THE PUBLIC.*

By FRANK OVERTON, M.D.

THE ideal relation of a health officer to the medical profession is that of a specialist to the great body of practising physicians. A health officer must necessarily become an expert in diagnosing, treating and preventing infectious diseases, and if he does not impress the idea of his superiority upon the rest of the medical profession it is his own fault. But this very impression of superiority and authority is often a great occasion of offense which is likely to bring the health officer into disgrace with the medical profession. A health officer has need of a full measure of tact, diplomacy, and courage. If he has not these qualifications he had better quit his job. But if he has these qualifications he will be one of the greatest of all the powers for the unification of the medical profession.

Suppose the health officer and the family physician disagree upon diagnosis, treatment or quarantine. The health officer can act like a bull in a china shop, and can probably carry his point at the expense of the respect of his colleagues. A sure way out of the difficulty is to call in a consultant in whom both the health officer and the physician have confidence, and to abide by his decision. In this way the family physician and the health officer become co-workers and friends. There is always some common ground which will stand the test of reason and common sense.

What shall be the attitude of the health officer toward the family physician in the matter of suspicious cases? The laws and customs require family physicians to report only cases in which the diagnosis is evident, but we know full well that the cases which are the most dangerous kind are the mild, untreated, unquarantined ones. Has the family physician such confidence in your skill, common sense, and diplomacy that he will call you in suspicious cases? If he has, then indeed you are to be congratulated, and to be honored as one who has solved one of the most perplexing of all the questions which confront a health officer.

What is your attitude toward those doctors who persist in making a distinction between the mild and the severe cases of contagious diseases? For instance, what in the world shall you do when a doctor tells his patient that a case is not real scarlet fever, but is a mild, non-infectious form called scarlatina, or scarlet rash? Well, the only thing to do is to explain to both the family and the doctor kindly and scientifically just wherein the danger lies. A good thing to do when a mother kicks against quarantining such a mild case is to require her to get a written statement from the doctor that the patient cannot spread

his disease to others. This will solve the difficulty at once and no one will get mad over it.

What is our relation to the medical profession in the matter of quarantine? We are all making more fuss than we need to make over quarantine, and the family doctors all know it. The best solution of the difficulty is the adoption of three degrees of quarantine, as recommended by Dr. Howe at our last State Conference.

Does the medical profession look upon us as jokers, or does it look up to us with respect and confidence? It all depends upon our ability as administrative officers. If we have one cast-iron way of conducting the office we will be a lonesome lot, without friends, and without influence, except such as is conferred by the letter of the law. But if we administer the affairs of the office with common sense and diplomacy we will gain the respect and confidence and love of the medical profession.

What are our relations to the public? They will be just what they are to the medical profession. The public is about thirty years, or a generation behind the medical profession in the matter of common knowledge of medical topics, and the medical profession is about five years behind the advanced leaders and specialists. Who are the teachers of the public in matters of preventive medicine? Probably no one influence is greater than that of the health officer. If he has the co-operation and respect of the medical profession the public will also co-operate with him and respect him, as sure as day follows night.

There are two kinds of quarantine. First, is the formal isolation which is imposed upon a suffering household by the health officer. This may or may not have the co-operation of the afflicted ones. The second kind of quarantine is that which is the result of knowledge and co-operation on the part of those quarantined. It is easy to nail a quarantine tag to the front door and place a guard at the front gate; but it requires time, patience, knowledge, and tact to instruct the afflicted family in the hundred details of the care of infected articles. The health officer who is worth his salt will spend at least half an hour with each case in giving detailed instructions concerning quarantine.

There are two great difficulties in the way of imparting knowledge to the mother and amateur nurses. First, the conditions are extraordinary, the nurses are excited, and are in no mood to remember what has been said to them. In the second place, the mothers and nurses want to waste a flood of words in telling the health officer how well they are already taking care of the case. The only thing for the health officer to do in these cases is to forbid the mother or nurse to say a word until the instruction is ended. It is no excuse to the health officer to say that he told the family what to do. He has not fulfilled his duty until he has placed the family in

* Read before the New York State Sanitary Officers' Association, at New York City, October 24, 1911.

a receptive mood to receive his instruction. Moreover, a health officer has failed in administering the affairs of his office if he allows a family to be dissatisfied with his acts. Let him yield in non-essentials, but let him be sure that the family co-operate intelligently in all the essentials of quarantine.

Sickness, isolation and quarantine are all unpleasant and costly. The patient has a right to expect a cure, "tute, cito, et jucunde,"—completely, quickly and pleasantly. The sick person's opinion of the health officer will be founded principally upon their estimate of his pleasant manners. So long as this fact is so, let us act accordingly.

Are our relations to the public a joke, or a tragedy? Or are they cordial and confidential? The answer lies in ourselves.

The relations of the health officer to the public are mostly of a private nature, and the instruction which he gives is to individuals. This, in the aggregate, amounts to a great deal, for an immense amount of gossip and comparison of methods and means will follow every quarantine. But this is not enough. We health officers neglect our duty to appear in public and speak upon topics connected with our work. The State Department will furnish lantern slides and is anxious to have the co-operation of the health officers in the matter of public lectures and instruction. This work will supplement the teaching of the schools. It is one of the most promising of all the fields of a health officer's work. By it we can bring the public around to our way of thinking.

Certain legal powers are conferred upon health officers in order that they may protect the health of the public. The laws upon the subject are exceedingly brief and general. The law for epidemics is like the law for war—the end justifies the means. Anything goes in the presence of danger, but when the affairs are settled weeks afterward and the bills come in then there is often trouble. The statutory laws directly authorize the expenditure of money by local health boards for only three purposes: first, as compensation to the health officer for duties performed; second, as re-imbusement for expenses of attendance upon the annual sanitary conference; and third, as compensation for the care of smallpox or other extraordinary services. The tendency of the lawyers and the courts is to rule according to the strict letter of the law. The attorney general has ruled that no municipality has a right to pay health board bills for any other purpose than those stated above, and mentions specifically the fact that the payment for infected articles destroyed is illegal. The inference is that the health officer is liable for every bill which he contracts. The popular opinion is that a health board has unlimited power, but in the final analysis it has very little. Certainly it has little if it cannot legally contract bills. These facts have only re-

cently come out. They are surprising and appalling. Who shall remedy them if not the health officers themselves? This sanitary officer's association was started with the avowed purpose of taking definite action upon legal matters which could not come before the State Conference. It would seem to be a simple matter to draft laws which would remedy this state of affairs. We sanitary officers are the authorities who know what is needed. Let us co-operate with the State Department of Health to secure the needed laws at the next session of the Legislature.

THE CAESAREAN OPERATION.*

By J. W. POUCHER, M.D.,

POUGHKEEPSIE.

TRADITION says that the Cæsarean section was performed in very early times, probably upon a dead mother in an attempt to rescue a living child. It was also done in some countries in observance of certain religious laws which required the mother and child to be buried separately.

It was not until early in the 17th century that Cæsarean section was done upon a living mother, and it was not, however, until our own day, since Listerism has shown us the way to a perfect aseptic technique, that the operation has become a regularly recognized obstetrical procedure. So well defined are the conditions requiring this operation and so safe has it become in the hands of the surgeon that it is no longer to be considered an operation of last resort, but one that the experienced accoucheur should consider early.

There are two classes of cases in which Cæsarean section must be considered.

First comes the class of cases in which there is no other possible means for a safe delivery, either to the mother or child. These are the cases of deformed and generally contracted pelvis or pelvis occluded by exostosis, tumor of the pelvic outlet, or uterus, or malignant growth of the cervix or rectum, where there is an outlet of less than 8 or 8½ cm.

The only alternative is in cases where there is positive evidence that the child is dead, when craniotomy may be resorted to if there is a pelvic diameter of 3 inches (7 cm.) or over. In cases where there is a pelvic outlet smaller than this and in all cases where there is a living child to consider craniotomy should never be considered, for one must remember that it is nearly, if not quite, as dangerous an operation as Cæsarean section to the mother, and in the case of a living child the most repulsive of all operations ever devised.

Dr. Norris says "Is it not time, in view of the modern results of Cæsarean section, to formulate

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a general rule, to which there will be a few exceptions, that when the true conjugate is less than $7\frac{1}{2}$ cm. in simple flat, and 8 cm. in generally contracted pelvis, Cæsarean section in or before the onset of labor should be the elective operation."

Dr. Frederick in his excellent paper upon "The Present Status of Cæsarean section" says, "There can be little doubt that this statement is a conservative and correct one, and one safely to be used as a standard upon which to formulate decisions for or against Cæsarean section."

Now we come to a second class of cases. The physician or midwife is called to attend at the beginning of labor and makes an examination, perhaps for the first time. The presentation is noted and perhaps the discovery is made that the pelvis seems rather narrow, or, as often happens, nothing unusual is noticed until the labor does not seem to progress. He tries to deliver with forceps or possibly by version; then he calls in a colleague who examines and tries forceps, and then the discovery is made that they are up against it. A surgeon is consulted; someone who is known to have experience in such cases; and this is one of the places where he also is in one of the greatest dilemmas of his professional life. At the beginning of labor Cæsarean section was an easy and practically safe procedure, for in selected cases the mortality is almost nothing. But, in cases where all other methods of delivery have been attempted, where sepsis is very likely to have already taken place and where the mother is in an exhausted condition from long and unsuccessful effort, the result is equally doubtful by whatever method we try to deliver, for deliver we must. If the child is dead and the pelvis large enough (3 inches or over) craniotomy is the best course, but craniotomy upon a living child cannot be justified in any way at the present time. Puerperal sepsis is just as preventable as any form of surgical sepsis.

The great majority of obstetrical cases are attended by the general practitioner, and the safety of his patients demands that he shall observe certain precautions. He should always know, if possible, at least three months before confinement is due whether he has a normal pelvis or other conditions which may possibly complicate labor. If this is not possible and he is called to attend a patient at the beginning of labor his preparation must be just as thorough as that of a surgeon before attempting laparotomy. Simply washing his hands or immersing them in some antiseptic solution is not sufficient. The doctor is likely to have been dressing infected wounds; lancing abscesses or boils, or attending erysipelas and it is necessary that he use the greatest precaution. Even his clothing is likely to carry infection to a puerperal patient and a sterile gown and gloves are the surest safeguards.

Too much care cannot be given to the prepara-

tion of the external genitals and surrounding parts of the patient.

It is also of the greatest importance that the bedding, draw sheets and the clothing worn by the patient should be absolutely clean.

Every patient should be examined thoroughly in every case. Not only the primipara but every woman. Because the patient has borne one or more children is no reason why she may not have developed a fibroid, a carcinoma or a pelvic exostosis in the meantime.

Especial care should be taken of women who have a history of previous difficult labors; where a dead child has been born after a protracted labor and a difficult, probably high forceps, operation.

Although a high forceps operation may be safer than a Cæsarean after a long, tedious labor and a probable infection, primarily the Cæsarean is much safer for both mother and child.

It has been claimed by some that in this class of cases pubiotomy gives the mother a better chance than the Cæsarean operation, but judging from the statistics that I have been able to find I am satisfied that a pubiotomy as an elective operation should never be preferred to the Cæsarean, even if only the mother is to be considered, but when the safety of the child is also to be considered the Cæsarean operation is infinitely preferable.

It is in these cases where the surgeon has to elect one of the several courses, a probable high, difficult, dangerous forceps operation, version and probably forceps at last for the aftercoming head, with all the dire results upon both mother and child. The mother is too often fatally injured or so frightfully lacerated that she becomes an invalid for life, the victim of cystocele, rectocele and other deformities; and the child, when it is not stillborn, is too frequently either crippled or disfigured, or what is worse, owing to the prolonged pressure of the head between the pelvic bones or the injury of the brain by the forceps, the child lives to be an epileptic or idiot, whereas if Cæsarean section is elected the child is always normal, no possibility of deformity or injury and the only danger to the mother is that of any laparotomy.

CASE I.—Mrs. W., large, fat, primipara, 36 years old, 24 hours in labor. Referred to me by Drs. Borst and Wilson. No attempt had been made to deliver with forceps. I found a flattened pelvis with a conjugate of about 3 inches. She was removed to my private hospital and prepared for Cæsarean section; large, healthy boy was delivered; mother's recovery uneventful; left hospital on 14th day.

CASE II.—Mrs. R., small, primipara, generally contracted pelvis, 30 hours in labor, repeated efforts had been made to deliver her and the soft parts were considerably lacerated. Patient removed to my private hospital and prepared for Cæsarean section as the child was living at this

time. Operation done very rapidly owing to exhausted condition of patient; a large dead child delivered. The mother rallied nicely; died, however, 4 days later from septicemia.

CASE III.—Mrs. P., age 28, small, primipara, generally contracted pelvis. Examined this patient several times before term and decided to do a Cæsarean which was done at the beginning of labor. Mother and fine baby girl both made an uneventful recovery.

CASE IV.—Mrs. S., age 24, small rachitic dwarf, twisted and generally deformed pelvis, 24 hours in labor, no attempt had been made to deliver. Referred to me by Drs. Burns and Cotter. Patient removed to a private hospital. Cæsarean done and a fine boy delivered. Mother and child went home at the end of second week.

CASE V.—Mrs. K., age 35 years, primipara. Referred by Dr. Lown of Rhinebeck. Patient had been almost continuously in eclampsia for the past 16 hours. After consultation it was decided that both the mother and child would have a better chance from a Cæsarean operation than any other. The patient was at term and although she had suffered from labor pains during the previous night there was no appreciable dilatation of the cervix. The Cæsarean operation was performed, taking only 21 minutes, delivering a living but very feeble child which died several hours afterward. I left for home, leaving the mother apparently in better condition than I found her, but Dr. Lown informed me the next day that the convulsions returned that evening and continued till the death of the patient a few hours later.

CASE VI.—Mrs. B., age 30 years, primipara, flat, narrow masculine shaped pelvis. Referred to me by Dr. Heston after 24 hours labor. Cæsarean section was done as soon as patient could be prepared. The mother and a fine boy both made good recovery. Left hospital on the 14th day.

The patient should be prepared for the operation as carefully as possible in the short time that is usually given as very many of these cases come for emergency operations.

The danger of sepsis from the operation *per se* is no greater than in any other abdominal or pelvic operation and no less. The incision is made in the median line, and I begin just above the umbilicus enlarging my incision either way, depending considerably upon the shape of the abdomen and the size of the tumor, rarely finding it necessary to go very far below the navel. I like to have the incision well up over the fundus. After making an incision of about 6 inches through the thin abdominal wall the uterus presents in the wound. Several large gauze pads are then packed around the edges of the wound to protect the abdominal cavity when the uterus is opened. The incision, about 6 inches long, is then made into the uterus in the median line which can usually be determined by the

position of the fallopian tubes at either side. Most operators advise the use of a rubber band slipped down over the uterus to control hemorrhage. I do not think this necessary as I have never used it and have never had any hemorrhage to speak of. Another thing which almost everybody seems to be afraid of is injuring the placenta if it is located anteriorly, and I found it anteriorly in four of my six cases. In my first case on making my uterine incision I unintentionally cut pretty freely into the placenta and to my surprise it did not bleed as freely as I had been led to expect it would. I quickly finished the incision and thrust my left hand into the uterus, rupturing the sack and quickly grasping and delivering the child. Taking the child in my right hand, the left grasped the placenta which loosed easily and followed practically at the same time. The membranes came away easily. There was not any more hemorrhage altogether than in an average normal labor. I have never seen any hemorrhage from the uterine wall that even needed pressure or clamps. The uterus always contracts rapidly and firmly. While the uterus has been emptied and contracted there is always some difficulty in preventing the blood-tinged liquor amnii from overflowing into the abdomen and this cavity must be protected by gauze sponges and towels. This fluid, however, should be sterile and the danger from contamination is not so very great. The contracted uterus is then sutured. I use first a row of No. 2 20-day chromic catgut, passing through all the layers of the uterus down to the mucus membrane, placing them about $\frac{1}{2}$ inch apart, coapting the different layers as nicely as possible. After these have been drawn fairly tight and tied another row of No. 1 catgut sutures are placed in the peritoneal layer close enough to perfectly coapt that membrane. The uterus is then replaced and the abdomen closed as in ordinary laparotomy.

None of my patients have suffered from surgical shock and convalescence is usually less eventful than in ordinary abdominal operations such as appendectomy, probably because none of the abdominal viscera have been disturbed.

Although I have never used undue haste, none of my operations have taken over half an hour; 21 minutes being the shortest one.

The high Cæsarean section as I have described and which I have done in all of my cases was, as far as I can learn, first done by Dr. Davis of the New York Lying-in Hospital in 1904, but when I did my first one in September, 1905, I was not aware that anyone had done the operation or that a score of surgeons had not done it. It struck me that it was the most convenient and gave the best access to the cavity of the uterus; that it was through a part of the uterine wall that would be less likely to subsequent rupture; and also through a part of the uterus farthest distant from large branches of the uterine arteries and hence less likely to bleed.

The question that always comes up for consideration in this operation is, shall anything be done to render a patient immune against any further pregnancies. This has always seemed to me a very grave responsibility to assume. Then, too, after a first Cæsarean, the operation can always be a selective one with very slight danger. Cases I and III just reported by me have each had a successful second Cæsarean, and indeed women who have had two or three operations are not so very uncommon, and there seems to be a trend of modern opinion against the sterilization of these women.

Dr. Davis says he gets his patients up on the 8th day which assists evolution and keeps the uterus down into the pelvis thus taking it away from the abdominal suture and lessening the tendency to adhesion, another advantage of the high operation.

Just a word about statistics. Dr. Davis reported 256 Cæsarean sections done at the New York Lying-in Hospital up to 1910 with a mother's mortality of 14% and a foetal mortality of about 12½%. Out of this total he reports 124 uncomplicated cases with a mortality of 6½% for the mothers and less than 2½% for the children; and of these 8 deaths, 4 were due to pneumonia.

In my six cases I have had a mortality both maternal and infantile of 33⅓%, but as you will see in the two fatal cases, one was due to outside manipulation and probable previous infection; the other to eclampsia. Both being last resort cases.

LACTIC CULTURES; SOME CLINICAL OBSERVATIONS.*

By EDWIN I. HARRINGTON, M.D.,

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THE scope of this paper is to give the results of the use of the cultures, and also an attempt will be made to classify the forms of diseases in which favorable effects have been obtained and those in which few effects or none were observed. It is not sufficient to say the patient has intestinal indigestion, therefore give this treatment. In these cases the forms of infection are various and so divergent that some are partially antagonistic to others. We can not expect one means to be equally successful in treating diverse conditions; and in order that disappointment may not follow, and a valuable means of treatment be discredited, we should learn its limitations.

From a scientific standpoint this study is defective, as it has not been possible to verify the infections microscopically, that work requiring an amount of time and skill not available. From a practical standpoint, and a vital one, the con-

ditions have been unusually favorable, as the lactic cultures have been employed in fresh liquid form, and their purity and viability have been constantly tested microscopically and by culturing.

Formerly the writer used various buttermilks, liquid cultures, and tablets, with results so variable that those cases are not included in this report. Three years ago a laboratory was established, and the fresh liquid cultures have been employed since that time. The *bacillus bulgaricus* (*bac. of Massol*), was chosen, as probably the most effective of the oriental lactic germs, and it has been grown alone in pure culture. This bacillus is rod-shaped, non-motile, and of various lengths, producing by its growth lactic acid and no gas. The dosage has been, for babies one teaspoonful, 3 or 4 times daily, and for adults three to four teaspoonfuls 2 or 3 times daily, depending on the severity of the case, preferably given in sweetened water before meals, when the stomach hydrochloric acidity is low. However time will not permit further consideration of the cultures, and the subject has only been touched upon to show that this part has been treated with the requisite care.

We will next consider the principal disease in which the writer has used the cultures, namely, intestinal indigestion and auto-intoxication. From my experience the subject will be made clearer if we subdivide the form of indigestion known as the putrefactive into two classes, as they differ widely in character, and more widely in results of treatment. The first class taken up will be the very marked putrefactive type with odorous stools and indican in the urine. The infection shows the presence of various anærobic bacilli, most of which require an alkaline medium for active growth; two representative bacilli are the *bac. putrificus* and the *bac. arogenes capsulatus*. Clinically, I am led to believe that the *colon bacillus* while present, is not prominent in this type of infection. Some of these toxins producing bacilli are not normal to the intestinal tract but have been introduced by means of decayed or infected food, and the abnormal intestinal flora once established may continue for years. It has been possible in some of my cases to trace the beginning of the infection to some articles of food, causing acute trouble and followed by the chronic state. In this type constipation or diarrhœa may be present with odorous stool, and the amount of abdominal pain, tenderness, and distention is variable.

But most of these signs and symptoms are present in other forms of indigestion and to identify this kind we must find some distinctive characteristic. Judging from my cases the index of this highly putrefactive type is indican in the urine, and indolacetic acid will not be present, or in small amount. This type of indigestion varies in degree from the mild and acute to the severe and chronic. The symptoms frequently

* Read at the annual meeting of the First District Branch of the Medical Society of the State of New York, Yonkers, October 12, 1911.

seem disproportionate to the amount of indican excreted and some cases have had it in large amount with very few nervous symptoms excepting lassitude and lack of endurance; in other cases headache or pains in various parts of the body were present.

This is the form of indigestion in which the use of lactic cultures is most effective, and in my experience almost always curative. The cultures have been employed in these cases with no other medication, excepting cathartics, if required; the usual antiseptics were especially avoided, as they retard the growth of the lactic bacilli. The diet is most important and has been regulated as follows: Meat of all kinds and eggs should be taken in limited amount, a little once daily, and in severe cases it is better to withdraw this food entirely for the first week. The use of buttermilk and milk is very desirable if the latter contains no preservative, otherwise it greatly retards recovery. Fruits of all kinds and sweets may be taken freely; also the fats, cream, butter, bacon, and gelatine. If the starch digestion is good there is no objection to vegetables. Add bread and cereals to these articles, and we have a diet varied, satisfying, and sufficient for a short or long period as required. This low protein and high carbohydrate regimen will alone effect a cure of mild cases of indicanuria without medication; but the diet cure is slow and I have usually employed the cultures.

There seems to be little doubt about the mode of action of the lactic cultures in this form of indigestion; they increase the acidity of the upper part of the intestinal tract, and lessen the alkalinity of all parts below; the contents are rendered more and more unfavorable for the growth of the putrefactive forms, until the time is reached when they are not the dominant bacilli, and recovery is at hand. I am inclined to attribute the change more to the general increase in acidity, than to any specific action of the lactic acid either nascent or otherwise.

Two cases will be given briefly to illustrate this type of indigestion:

I. Treatment was commenced three years ago. A clergyman, aged 66, robust build, had suffered with indigestion for ten years and recently had become so debilitated, and his diarrhoea was at times so insistent, that he was compelled to give up work. He had taken large quantities of meat, especially beefsteak, with the vain hope of increasing his strength. Urinalysis showed a large amount of albumin with casts, and an excessive quantity of indican; the blood pressure was increased and the heart action irregular. He had little abdominal pain, no headache, was genial, not irritable, and had no other symptoms except lassitude and lack of endurance. He was given the lactic culture, and a strict diet was directed of the form before outlined. The improvement came rapidly and at the end of one month there was no diarrhoea, the albuminuria had reduced one half, and the urine showed little

indican, sometimes none. He has since remained in very good condition, the albuminuria has not increased and the indicanuria is absent, or present in slight amount. In this case it has been necessary to use continuously a small amount of culture, two or three teaspoonfuls daily, otherwise after a few weeks the indicanuria reappears though at no time has there been diarrhoea or lassitude.

It is reasonable to believe that this patient's long continued and excessive absorption of toxins was a large factor in producing the cardiac and renal diseases, and if so is a strong confirmation of the theory of Metchnikoff in respect to retarding old age.

Case II, treated 2½ years ago, showed quite different symptoms. Mrs. H., aged 32, had suffered with indigestion and nervous trouble for two years. She had few abdominal symptoms, but the nervous system was profoundly affected; severe headache, pain in the back of the neck, general exhaustion, sufficient to keep her in bed considerably, was apprehensive and did not have sufficient self-control to go to the church or theatre. Examination showed no organic disease, the skin was sallow, and the urine contained a large quantity of indican. She was given the lactic cultures and the diet described, and the gain after the first week was marked and in one month she was absolutely well. She took the culture for three weeks longer and has remained well to this time. In this case the transformation in color, strength, and control, was most remarkable.

Some other cases of this type have presented equally rapid and permanent recovery, but we cannot expect such good results invariably; some cases will be slower, some will relapse from time to time, and some will require a small amount of cultures almost continuously to maintain good health.

We will now consider the second class of cases of intestinal indigestion in which it is believed that the dominating bacillus is the *colon bacillus* and others of allied type. This bacillus is normal for the intestinal tract, but in these cases of disease some unusual type or strain may be present to give it the intense and abnormal action, or it may extend higher up in the small intestine. The *colon bacillus* grows in a wide range of either moderate acidity or alkalinity, and will attack the sugars as well as the protein food. It is a great gas producer, principally carbon dioxide and hydrogen. In this form of indigestion the actions are seldom offensive and there is a varying amount of abdominal pain, tenderness and distention. The urine shows indolacetic acid. If this infection be mixed with one already described both indican and indolacetic acid may be present, but in my experience this has not occurred very frequently, and the types have been distinct, especially in the severe cases. My tests of urine high in indolacetic acid have seldom shown indican.

The indolacetic acid appears to affect the nervous system more profoundly than indican. The reason for this has been stated to be, that the acid has not been paired and combined as a sulphate like indican. Whatever the reason the difference in effect is beyond doubt, and in the cases of indolacetic acid if very severe we have a long train of nervous symptoms, varying with the individual; some are tremor insomnia, feelings of worry and apprehension frequently producing inability to work. In this class and having an intestinal origin are many of the cases called nervous exhaustion, brain fag, and neurasthenia.

The treatment of this class of cases with the lactic cultures has not been so radical or effective as in the class first described; and in theory we cannot expect so good results, as we have an infection of bacilli that can grow in a slightly acid medium and in a wider range of foods than the bacilli of the other kind. My clinical findings in these cases are not conclusive; most of the mild or medium ones have recovered, but the treatment has invariably required time. The diet has been similar to that before described except that the sugars and sweet fruits have been limited. Two cases of this class will be briefly described: Mr. A., aged 55, broker, seen in June, 1911, had not been able to work for a year, had intestinal indigestion with much flatus, was nervous, apprehensive, and unwilling to assume any responsibility. The urine showed considerable indolacetic acid but no indican. He was given the lactic cultures and improved slowly, but at the end of two months he had enough control of his nervous system to resume work. Have seen him recently and find that while he has not fully recovered, and that his urine still contains some indolacetic acid, he is greatly improved and is able to work.

A second case of this kind, Mr. M., aged 51, private secretary, seen in July of this year, had been unable to work for one month, had indigestion, was nervous, some tremor, morbid about his future, anticipating some general breakdown. Examination showed no organic disease, but the urine contained much indolacetic acid and no indican. He was placed on the lactic cultures and given as much encouragement as possible. In two weeks he returned to work and is now in fairly good health but a little indolacetic acid is still present.

Frequently patients of this kind become morbid and think they are on the verge of serious disease or insanity. The encouragement should be strong and emphatic and will prove an important factor in recovery.

Two cases of severe type belonging to this class have been treated, each with a large amount of indolacetic acid present. Both had evidences of gall stones and the colon bacillus infection undoubtedly extended high up in the small intestines and probably involved the gall bladder. There was a general hyperacidity of secretions, and the saliva was frequently acid. The lactic

culture did not appear to help these of maximum extent.

The cases treated have been mostly of the two types described and I am not prepared to report at this time what value, if any, the culture would have in other forms of indigestion.

To summarize my observations it appears that, in putrefactive indigestion with indican, the lactic cultures have a radical and curative effect; in the form with indolacetic acid apparently favorable but slow and more uncertain.

The best guide for the treatment of these cases is frequent urinalyses, to determine the approximate amount of toxins present so that the dosage and diet may be regulated accordingly. The following tests are reliable and can be made easily and rapidly:

For indican (Obermeyer test) take a 4-inch test tube with 1-inch or a little more of urine, and add the same quantity of hydrochloric acid (sp. gr. 1.20) containing 0.3% of ferric chloride. Add $\frac{1}{2}$ inch of chloroform and cork and shake well. If indican be present the chloroform will turn blue more or less according to quantity. The reaction takes a little time.

For indolacetic acid take a short test tube with $\frac{1}{2}$ inch hydrochloric acid (sp. gr. 1.20). Take another test tube with $\frac{1}{2}$ inch of urine and add to it a few drops of 0.1% potassium nitrite. Float this carefully on the test tube with hydrochloric acid. If indolacetic acid be present the line of meeting will show a pink band, the amount of color indicating the quantity.

We will next consider another class of cases, the enterocolitis of infants, by far the most important phase of this subject, for it is here that lives can be saved. These babies present a form of disease very similar to that first described where the index was indican.

The stools are putrefactive in varying degree, the urine contains indican and the toxic absorption produces fever and nervous and cerebral symptoms. In my experience of three years with these cases, the lactic cultures will invariably cure, and a few of my confrères in this city have had equally favorable results. This strong statement should be qualified in one respect; if the disease is so far advanced that the case is within twenty-four hours of death the cultures cannot be expected to save it, as their action is not immediate. Fortunately this change of the intestinal flora takes place far more rapidly with infants than with adults; for in the former the intestinal tract is shorter and is not subject to enteroptosis or other causes of stagnation frequently present in adults; another advantage is that the stomach hydrochloric acidity is never great enough to make the cultures inactive; also the baby's food, milk, is the best for making rapid progress. The time required is usually about two or three days before the stools become yellow and normal, and the fever, pain, restlessness, or other symptoms have subsided. The procedure is as follows, for babies of any age, as those

only three weeks old have been treated in this way: The primary dose or two of castor oil is usually employed. No antiseptics or other medication are given except lime water, or a little calcium carbonate, as the lime salts promote the growth of the lactic bacilli. The cultures are administered in doses of one teaspoonful every six hours, or better a half teaspoonful every three hours, in a little water with half a teaspoonful of milk sugar. The best diet for the first one or two days is whey, made from pure milk, and diluted according to age; when the worst symptoms have abated, milk may be added in increasing quantities. For the older babies barley water, or other cereal water with milk sugar makes a desirable addition to the limited food permitted. Milk or whey is the natural and best culture ground for the lactic bacilli and theoretically this diet should be the most perfect for gaining rapid results. Practically I have not been able to use it very much, but have been compelled to rely on a cruder and slower but safer method of feeding. Considerable of the milk sold in cities contains some antiseptic and the lactic cultures will not grow in this preserved milk, either in the laboratory bottle or in the baby, and the effects of treatment will be lost. But one may ask, why stop milk or whey if perhaps only a small portion of that sold is unfit for this use? We cannot afford to take even a slight risk, for in some cases when we discover after two or three days that the usual progress toward recovery is not being made, we may have lost too much time to change food and save life. Unless absolutely certain of the purity of the milk I have been accustomed to employ the following diet, far less perfect, but without danger of failure. For the first one or two days barley water or some cereal water with lime water and milk sugar is given, and as the case improves a little condensed milk is added, gradually increasing the quantity until recovery, when the ordinary nourishment is resumed. A peptone or hydrated albumin must be present with the sugar to produce a good growth of the lactic bacilli. Theoretically it would therefore be advisable in very young babies to add a peptone to the barley water, or to give a weak peptone solution alone with milk sugar. In many cases I have not used the peptone with the very young, and have found a weak cereal water with milk sugar a satisfactory medium for the lactic bacilli to accomplish their work, especially if a very small quantity of milk be added. In breast-fed babies the milk has usually been continued from the first and the cultures have been given between the feedings. In all cases, on whatever diet, when the stools have become normal and the symptoms have subsided, the dose of culture has been reduced, but a little has usually been given for a week or more. It has not been necessary to use rectal or colon washings, but they have been employed in a few cases for the first day. At the best this means can only cleanse a small portion of the intestinal tract, while the

lactic cultures purify the whole length by replacing an abnormal flora with one nearly normal.

Several cry babies with green and undigested stools had a form of infection that yielded to this treatment in the same manner as babies with cholera infantum. A few cases of marasmus, not of tubercular nature but due to intense intestinal disorder and malnutrition, have been treated, with recovery, the same methods having been followed as before described, though the treatment was naturally more prolonged. Even in cases apparently hopeless this treatment should be tried.

This résumé of three years' work does not include all diseases treated by the lactic culture, but the other cases have been too limited in number to make the observations conclusive, and to be worthy of presentation to you at this time.

Independent of adult life, if we consider the use of this means for babies only it seems to me bound to occupy a commanding position. However, we must understand that it requires more watchfulness, all along the line, than the use of drugs, and without great care we will not obtain results. We are administering a thing of life, and it is absolutely essential that it be viable, and capable of reproduction in a favorable environment.

THE VALUE OF URINARY EXAMINATION IN INFANTS.*

By FRANK VANDER BOGERT, M.D.,
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IN beginning a paper on this subject I feel that I could not do better than to quote from Thomson's "Clinical Examination and Treatment of Sick Children." Dr. Thomson says, "In the clinical examination of children few things are more important than the examination of the urinary tract. Its maladies are not uncommon; they are frequently serious; and they are very easily overlooked. This is especially true in early infancy, because then even acute diseases of these parts may exist without giving rise to any ascertainable localizing symptoms, apart from the state of the urine."

In a paper published in 1906, in the *Journal of the American Medical Association*, Dr. Fussell, of Philadelphia, says that everyone who has seen much of medical practice throughout this country must realize with sincere regret that the most careful laboratory helps in diagnosis, including urinary examination, are woefully neglected by the average practitioner of medicine. Dr. Fussell quotes from his own records of several hundred cases to show that approximately 20 per cent. of the urines examined were abnormal, and concludes that if these abnormalities can be shown to have any effect of importance on either diagnosis, prognosis or treatment, surely it is

* Read before the Fourth District Branch of the Medical Society of the State of New York, at Ogdensburg, October 10, 1911.

worth while to examine five urines to find one abnormal one.

Probably to-day the examination of urine in adult practice is not nearly so woefully neglected as at the time when Dr. Fussell's paper was written. In the case of children, however, and especially infants, conditions have probably improved but little.

The collection of urine from infants presents some difficulties, and to this is probably due the fact that its examination is so often neglected. With analysis of the urine of adults, a routine procedure in most hospitals to-day, it is rather surprising that so little attention is paid to the urine of the baby. In the Ellis Hospital, at Schenectady, where routine examination of adults' urine is made, I have been told by the present medical resident physician that he has never been called upon to examine a specimen from an infant, except in my own service, and I do not remember a single case seen with a general practitioner where such an examination had been made.

The collection of the specimen is naturally more difficult in the case of females. The old method of placing absorbent cotton over the vulva or penis is decidedly unsatisfactory because of the almost certainty of contamination. Still, of London, condemns it especially because of the tendency of the cotton to filter the urine and to hold in its meshes such important elements in diagnosis as pus cells. Albumen or sugar may be detected in specimens obtained in this way. Dr. Still's simple plan of allowing the infant to lie for a few hours on a water-proof mackintosh, arranged so as to retain the urine passed, appears to me to be open to the same objection as the cotton method, namely that of contamination, which can hardly be avoided where so large an area of the infant's body remains in contact with the urine.

In boys probably the most satisfactory method is the application of a heavy test tube or small wide-mouthed bottle over the penis, or if a bottle is used, enveloping the whole penis and scrotum, which should, of course, be clean before the apparatus is applied. The receptacle is held in place by an adhesive strap buttonholed to admit the neck of the bottle or the shoulder of the test tube. The upper end of the strap adheres to the skin over the pubis, and the lower end is split and attached to either buttock. A slanting position of the child upon a pillow aids in retaining the specimen after it is passed. A rubber condom is suggested in place of the bottle.

In girls the same method may be used with fair prospects of success, although more difficult of application because of the danger of leakage, or a cup may be placed over the vulva and held in place by the diaper. I have obtained a satisfactory specimen by placing a small English egg-cup over the vulva, the base of the cup being but-

tonholed through the lower fold of the diaper to keep it in an upright position.

Holt says that a plan nearly always successful is to put the infant upon a chamber after a long sleep, this should be done on the instant of waking, or the child may be awakened for the purpose. A specimen may often be obtained by placing the baby on the vessel immediately after the bath, and the application of a cold hand over the bladder is said to facilitate matters. Again, a hot water enema may cause the passage of urine, a method recommended in treatment of retention.

A method described by Dr. Lawrence, of Boston, and one which has been used in the Boston Floating Hospital in a number of cases for the collection of urine from female babies is as follows:

In a strip of adhesive tape there is cut a hole a little larger than the vulval orifice of the infant from whom the specimen is to be obtained. The end of the strap which is to be applied posteriorly is split into two tails, the cut being carried close to the hole. A glove thumb is dropped, tip first, through the hole in the strap, the adhesive side of which is held uppermost. That part of the rubber thumb which remains above the hole is turned down on the adhesive surface of the strap and pressed firmly against it, care being taken to have the rubber flange narrow enough so that there will be a band of adhesive surface around it. The tip of the thumb is cut off, a test tube inserted and the joint made tight by wrapping it with adhesive tape. To apply the apparatus, the strap is placed over the perineum so that the opening in it lies over the vulva, the anterior end extends up on to the lower abdomen, while the posterior tails are directed backward and outward over the buttocks, avoiding the anus. When the strap is in place the vulval orifice is covered by the open end of a rubber funnel through which the urine drains into the receiving vessel. If a single specimen is desired, the heavy test tube may be allowed to rest between the baby's legs, the upper end being slightly raised. To obtain a twenty-four hour specimen rubber piping is led to a bottle on the floor as in continuous drainage of adults.

There is some question as to the advisability or even justification of catheterization for the simple purpose of securing a specimen. The procedure is painful, and unless most carefully done, traumatism can hardly be avoided. Holt, however, speaks of this as the most certain of all means, and says that in females sometimes nothing else will answer the purpose. Kerley says that for accurate work the specimen should be obtained by catheterization. But in speaking of local treatment for retention of urine, says, "It is always advisable to attempt relief through the use of hot stupe or the enema before resorting to catheterization." Thus giving the impression that he fears the catheter. Fischl, in Pfandler

and Schlossmann's "Diseases of Children," recommends a metal catheter for collection from girls, and other authors suggest it may be necessary to use the catheter.

In my own little experience, however, the procedure has never been necessary, though I can, of course, conceive of cases where the value of an absolutely uncontaminated specimen might more than atone for the pain, discomfort and danger to the patient.

Eustace Smith speaks of the danger of a too rapid emptying of the bladder by the catheter in cases of retention with distention due to relaxation of the muscular coat, and says that if the bladder be suddenly and completely emptied of its contents, the organ contracts imperfectly and causes great irritation.

Of the acute conditions of the urinary tract in infancy probably pyelitis or pyelo-cystitis is most frequently overlooked, and in no condition in infancy does an examination of the urine give such satisfactory results.

In an editorial appearing in the *Archives of Pediatrics* during the present year, the writer says that "any case of fever in a child without definite signs must be freed from the suspicion of pyelitis by a urinary examination." Morse, in an article on obscure fever in infancy and early childhood, says of pyelitis that in the vast majority of cases there is nothing whatever in the symptomatology to call attention to the urinary tract, and that the diagnosis is usually first made when the urine is examined, although experience leads one to suspect this condition when the temperature is elevated without definite cause.

The condition, being so often due to an upward migration of the colon bacillus from contaminated external genitals, is naturally much more frequent in girls. Box, in the *Lancet*, 1908, says that it is twice as common in females; this is probably a very low estimate. Still has seen two cases in boys against eight in girls. Thomson speaks of it as being almost always confined to the female sex. My own cases have all been in girls. The urine shows albumen, pus, casts and epithelium, together with bacteria, of which the colon bacillus is most frequent. Staphylococci, streptococci and gonococci and the typhoid bacilli, however, are also found. A culture will be necessary to demonstrate the variety of organism present. In early cases the urine is acid in reaction, in later ones it may be alkaline. A diagnosis of acute cases may with some certainty be made upon the presence of pus and bacteria in an acid urine. The infection is especially prevalent in summer following gastro-enteritis.

Acute nephritis is rare in infancy. At the time of his 1909 edition, Holt had collected 24 cases of the primary form, including 10 of his own, occurring in children under two years of age. Dropsy was noted in but six of these cases, the

condition, therefore, in the absence of a urinary examination must be frequently overlooked; 16 of Holt's cases died, an argument for early diagnosis through urinary examination. Albumen was frequently absent early in the attack, but was invariably present at a late period, although rarely in large amounts. Casts were found in all cases that were examined carefully, chiefly of the hyaline, granular and epithelial variety. The absence of albumen in nephritis, at times at least, is an argument in favor of frequent examinations and of routine microscopical study, as well as chemical analysis.

Neumann, of Berlin, found albumen and tube casts constantly in his cases of alimentary intoxication, and believes that they simply signify irritation of the kidneys, no pathological anatomic changes being detected. Eustace Smith says that we are only justified in inferring the existence of renal disease when hyaline and granular casts are found. Blood casts, he says, are no indication of organic disease of the kidneys, but may be due to passive congestion as in cases of heart disease or bronchitis.

Acute nephritis in infancy may be caused by the irritation of highly concentrated urine, as in two of Holt's cases where the infants had been taking for a long time very little food and almost no water. The disease may be secondary as in later childhood to the acute infectious diseases. I have recently seen a case following gastro-enteritis in a baby of thirteen months, in which there was but a trace of albumen, but an abundance of casts and pus cells.

An examination of the urine may be of some value in differentiating between simple icterus neonatorum, and the graver forms of jaundice, including atresia of the bile ducts. In simple icterus no bile is present in the urine, whereas bile is present in the severer conditions. This item in diagnosis may be of especial importance where an apparent simple icterus continues for a long period, as in the cases reported by Still in which the jaundice persisted from nine and one-half to ten weeks.

Jacoby gives as the reason for the failure to find bile, the comparatively small amount of bile present, too small to react to the Gmelin test, and says that because of the failure of this reaction there has long been doubt as to its identity. A reaction may be obtained by filtering and testing the filtrate under the microscope. Holt says that in most cases the urine is normal, and that only the most severe cases contain bile pigment.

The finding of blood or of red blood corpuscles in the urine may be of great importance in diagnosis. Blood cells may be the first indication of an infantile scurvy. Thomson says that the presence of red blood corpuscles in the urine of cases that are doubtfully scorbutic forms very important evidence in favor of the diagnosis of this disease. Hæmaturia may be due to uric acid infarcts and here it may be well to draw

attention to the very close resemblance upon the diaper of a deposit of uric acid crystals to that of blood. A chemical or microscopical examination of this deposit ought to suffice to determine its character. Henry Morris in Keating's *Cyclopedia* says, "It is but a step between the formation of gravel and a stone in the kidney. If the crystals are passed we have gravel, if cemented together by mucus or blood-clot, we have a stone." Hæmaturia may direct the attention toward a renal or vesical stone, as may the condition of the urine generally, acid, highly colored and often depositing uric acid crystals and amorphous urates. Calculi are not uncommon in early life. Hunt in Keating's *Cyclopedia* says that 50 to 60 per cent. of cases of stone in the bladder occur in children under sixteen years of age. Holy speaks of their extreme rarity in infants, but says they are not infrequent in children between two and ten. Of 1,621 cases collected along the lower Danube, where these cases are exceedingly common, the majority were between the ages of two and seven. The youngest was two months. Meigs has removed a stone from the kidney at six months. A stone has been removed from the urethra of an infant of one month.

It is well to remember that many more boys are affected. Kelley puts it as high as 20 times. Whether this difference is due to the anatomy of the parts, the shorter and more patulous urethra allowing an easier exit to the stone, or to inability to completely empty the bladder, thereby allowing the accumulation of residual urine, this in turn being brought about by long foreskin with narrow prepuce opening or small miatus, is somewhat beyond the province of this paper.

The pain of calculus may simulate intestinal colic, or even appendicitis, as in a case of an older child reported by Fussell. In cases of apparent persistent colic, uric acid crystals or concretions should be looked for.

Other causes of hæmaturia include tuberculosis, malignant growths, sepsis and hemorrhagic purpura, where the bleeding may occur with a gush and cease entirely for a time, requiring frequent inspections of the urine for its detection.

Simple temporary or transient glycosuria is said to be rather common in infants fed upon much sugar. Koplik says that dextrose is not found in the urine of healthy infants, and only appears in the urine of infants suffering from gastro-intestinal diseases. In many of the reported cases the reaction has been obtained by the fermentation test. The sugar was probably lactose. Morse believes that a simple glycosuria can be excluded on persistence of symptoms and the presence of sugar in the urine when there is only a moderate amount of sugar in the food.

Diabetes is very rare in childhood. Holt speaks of its occurrence in infancy and refers

to a case reported by Pavy of a child dying of the disease in two years. Kerley's youngest patient, up to 1909, was three years old. According to Cotton there were four deaths from diabetes in babies under one year, in ten years in New York City, and in Chicago three deaths were reported during four years. Thomson says that diabetes may occur at any age from a few days upwards, and that when sugar occurs in any considerable amount its presence is always of very grave significance as it indicates diabetes.

From the foregoing we may fairly conclude that we are not justified in neglecting this phase of the analysis.

THE IMPORTANCE OF EARLY OPERATION IN ACUTE MASTOIDITIS.*

By LEFFERTS A. McCLELLAND, M.D.

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THIS short paper, suggested by experience which has been enlightening in some degree, is read for the benefit of those who, like the author, have had to have proved by actual experience that what seems to be conservatism is often a most pernicious frittering away of opportunity for doing good work. With the conscientious surgeon everything is sacrificed for the benefit of his patient's health and life. At times it has seemed dutiful to abstain from promptly operating on a mastoid which seemed little the better for having been given some chance for drainage through the recently made incision by way of the membrana tympani as so short a period had elapsed since the inception of the infection that hope led almost to the belief that relief from the increasing symptoms must soon supervene. Temporizing methods have been practised in reference to the mastoid disease except so far as treatment by the tympanic route permitted efforts at facilitating drainage. Time and again in the past years have these cases been too long subjected to inefficient palliative treatment, medicinal, topical and surgical, when it would have been better to have promptly invaded the antrum, the already infected reservoir, so that it could be completely emptied and its walls thoroughly cleansed as well as that the channels converging at this point should be opened and a proper cleansing of the whole sewage system from the antrum through the aditus to the tympanum be properly done. Could these cases be handled from the start in so direct and practical a method it would be a rare occurrence to find that extension of the suppurative process had occurred beyond the antrum or its contiguous cells. With the infection so localized and within such easy reach of the surgeon such a method would be conservative in the best meaning of the word. This plan of treatment would limit the amount of pain which a patient usually

* Read before the Second District Branch of the Medical Society of the State of New York, at Brooklyn, October 26, 1911.

suffers since it would diminish or remove the pressure responsible for the same while the elimination of the systematic infection would tend toward the reduction of fever, headaches, etc. Still more important, the prompt opening up and cleansing of the channels between the antrum and the external auditory canal would modify and possibly prevent that maceration within the tympanum, which is so very detrimental to the integrity of its mucosa. Thus would there be less liability of deep necrotic changes occurring to the bony walls of the cavity involved while the orifice of the Eustachian tube would naturally be the more competent to aid the process of drainage, one of its chief functions, since the mucosa being less swollen at its mouth would the better fit it for receiving the outflow in the drainage process. It cannot be denied that there are cases of acute suppurative otitis media with mastoid involvement which recover without opening the mastoid. However, in a case of *Otitis media acuta suppurativa* which in spite of active and proper treatment (such as prompt and free incision of the membrana tympani properly done, irrigation with warm antiseptic solution through the Fowler irrigator, suction by Siegel's otoscope, rest in bed, leeches, ice to the mastoid if tender, free catharsis, together with such attention to the nose and epipharynx as is necessary) remains unrelieved after forty-eight hours of such trial the question as to whether it is deemed expedient to take off the cap of the antrum in the hope of emptying a full bowl of pus and relieving the condition of the tympanum as well becomes a very important one.

It is generally believed that in all violent suppurative diseases of the tympanum some involvement of the mastoid antrum obtains. This being conceded, and it seems reasonable, the sequence of an increased pressure due to a drum full of pus may easily exert its natural tendency to push its way through all the convenient openings connected with the drum, than which there are few more willing to accommodate it than the narrow, short and direct passage, the aditus, which leads directly to the antrum, so capable and willing to accommodate the overflow oftentimes even before the membrana tympani bursts or is opened surgically. Too often the tympanic lips of the Eustachian tube, as indeed the lumen of the tube itself, are so swollen that this avenue of escape is closed. Two other channels, in such a contingency, are open for the relief of the overburdened tympanum, which can no longer contain all the pus being manufactured; the outflow must be through the ruptured or cut membrane or upward and backward through the patulous aditus to and into the antrum.

While, as has already been suggested, there are mild infections involving the entire middle ear, including the aditus and antrum as well as the Eustachian tube, which may well be allowed a reasonable period of time in which to recover

under the beneficent and beneficial treatment established through drainage properly arranged through the external auditory canal together with other additional treatment usual in such conditions, still if there develops tenderness over the mastoid antrum, elicited on deep, firm pressure, and especially if the patient still suffers pain in the ear, notwithstanding the drainage, which may be only moderate in degree, it seems wise to consider the question of doing a simple mastoid operation to cure the condition before serious damage may be done. It is certainly the safer plan since there is considerable doubt about the actual condition of the mastoid and this can best be determined by exploration and operation which is practically devoid of danger in competent hands.

If, however, the discharge is gradually diminishing, pain having subsided, mastoid tenderness going or gone and the temperature shows no suspicious turn it may safely be considered wise to continue the simpler plan of treatment.

The antithesis of this condition frequently found, especially in influenzal infections and in the infectious diseases such as typhoid fever, scarlet fever, measles and diphtheria, demands the promptest intervention. Here there is a systemic invasion with the ear disease as only a concomitant.

These cases are prone to be so virulent that it is imperative in the interest of the patient's life that immediate operation be done and that promptly. From a considerable personal experience it has been proved that an acute suppurative disease of the middle ear of influenzal origin which has been promptly treated by free incision of the drum, ice, catharsis, *et al.*, and in which the flow of pus is abundant and especially when it is of a greenish color, where pain persists and mastoid tenderness, however slight, is maintained for more than twenty-four hours, whether the fever is high or not, should be operated on forthwith for where this has been delayed for three or four days in severe cases it has been marvelous to contemplate the extent and character of the destruction of bone which has supervened.

I have yet to see any class of cases more fulminating in their type than these. It seems as though the army of bacteria responsible for the attack on the citadel of the mastoid must have been commanded by a Napoleonic sort of general so efficient and orderly has been the destruction of the environs of the mastoid antrum. No sooner is the antrum involved than the final finishing touches are attempted by mining under the roof of the tympanum and antrum and the floor of the middle fossa of the skull is invaded. The only hope for the victim's life is in following these marauders with scalpel, hoe, chisels, bone forceps, gouges, scoops, and fuses in the form of gauze drain, undermining their army and routing them completely. This often means very radical surgical procedure the more extensive the

later the charge is begun. When we scan our records which record the extensive necrosis of the mastoid cells often involving the middle fossa or encroaching upon the great channel which conveys the venous blood from the brain to the jugular we should be impressed with the importance of prescribing and practising a form of treatment which offers a safe and successful method of terminating what would otherwise likely prove a dangerous if not fatal form of microbic infection.

In dealing with these virulent infections experience is loud in calling for immediate surgical intervention if the patient is to be spared extensive operation and have the best chance for life.

SOME FACTS CONCERNING THE FAUCIAL TONSILS AND THEIR COMPLETE REMOVAL.*

By JAMES F. McCAW, M.D.,
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I FEEL like apologizing for presenting to this society a paper on the faucial tonsils, but am prompted to do so from the fact that, although the literature on this offending organ is voluminous, there are still many physicians who do not or will not see the light and ignore the importance of diseased conditions of these glands and the influence which they may have upon the entire organism. In order that we may better understand the relation of some of the conditions, of which the writer will speak, to the tonsils, I beg your indulgence for a short description of the anatomy. The faucial tonsil is a mass of lymph tissue situated in the sinus tonsillar between the pillars of the palate and rests upon the fascia of the superior constrictor muscle of the pharynx. The plica tonsillar is a membrane extending backward, partially covering the tonsil and apparently acting as a suspensory. This membrane is sometimes very highly developed and may almost completely cover the organ. The importance of this I will speak of later. The supra tonsillar fossa, a most important space, is triangular in shape, situated above the tonsil into which empty the larger crypts. This space may sometimes extend down and external to the gland or up and outward into the soft palate. It has a fibrous capsule, with trabeculae extending through the tonsil to its inner surface. The crypts vary in number and size, but in general the larger ones are situated in the upper part: There is a direct connection between the tonsil and the cervical lymphatics, both superficial and deep. It has also been proven by different investigators that there is an intimate relation between the cervical, the bronchial and mediastinal chains. The tonsil is in close relationship with the eustachian tube, being just below and anterior to it.

Of the exact physiology of the tonsil we still

* Read before the Fifth District Branch of the Medical Society of the State of New York, at Utica, N. Y., October 5, 1911.

know very little, but there are certain phenomena regarding it which have been proved experimentally and which have been recorded over and over again clinically. It is a well known fact that normal tonsillar tissue offers a certain resistance to the absorption of all kinds of bacteria, both pathogenic and non-pathogenic. It is also as well known that pathologic states of the tonsil lowers this resistance and, in fact, invite bacterial invasion, which sooner or later penetrate the tonsillar tissue and find their way into the cervical lymphatics and ultimately into the general circulation. The complications following such a process depend necessarily upon the nature of the infecting agent, its virulence, the resistance of the individual and whether or not we close the port of entry to further infection. The diseased tonsil is supposed to be one which is hypertrophied or enlarged and projects beyond the faucial pillars; and in general this is true. But on the other hand, the hard fibrous tonsil which is deeply buried and submerged, where the plica tonsillar is well developed almost completely covering it, interfering with the proper drainage of the crypts, which takes place with each act of deglutition; in fact forcing the contents deeper into the tonsil, thus favoring absorption, is the worse form and frequently more diseased than the enormously enlarged ones; although to the casual observer examining such a throat they appear perfectly innocent. It is not difficult to understand that in such a tonsil the secretions are retained in the crypts which form a most perfect culture tube for the propagation of bacteria, which can readily be absorbed, and distributed throughout the body. In the light of experimental research and abundant clinical observation, the etiology of tuberculous glands of the neck has been established. Many laboratory workers, both here and abroad, have established the fact almost beyond doubt that the tubercle bacillus can and does penetrate the tonsil tissues and finds its way into the cervical lymphatics, producing marked enlargement and may sooner or later produce similar conditions in the mediastinal and bronchial glands and ultimately apical tuberculous processes. It is particularly unfortunate that these destructive pathological conditions may take place without any characteristic appearance of the tonsil to draw our attention to it as the offender, and only by our keeping in mind the proven fact that the faucial tonsil is the port of entry of this infection and the application of appropriate treatment to it, will we be able to shut out further invasion. Here again the submerged tonsil with crypts filled with cholesteatomatous masses and interference with drainage may be the greatest offender. Therefore, to operate for the removal of glands in tuberculous cervical adenitis, without removal of the tonsils, is a mistake which should have long since been recognized. The tonsils are like a reservoir which continues to feed its tributaries (the lymphatics) with bacteria. This

being a fact, why is it not logical to remove the tonsil entirely to prevent the entrance of the invader?

Another fact to which I wish to call your attention is the frequency of nephritic complications following acute tonsillitis. This is just now beginning to be recognized and its importance taught. Loeb, in a paper on this subject, read in 1910 before the A. L. R. & O. Society, quotes many observers, and the consensus of opinion based on clinical observation is: "that tonsillitis, whether of a severe or mild type, may be the cause of acute inflammation of the kidneys." It is probable that tonsillitis is more often followed by nephritis than is commonly supposed and it is very likely that in many cases that are considered primary, the infection enters through the tonsils, the local manifestations not being severe and having been forgotten. It must be remembered that not only the severe anginas may cause nephritis, but that very mild—even ambulatory—cases of tonsillary infection may result in the affection of the kidneys. This being true, tonsillitis should not be looked upon as it usually is, as a simple disease of but little importance. The disease, which can cause acute endocarditis and acute nephritis, is certainly one worthy of consideration. The peculiarity of this complication is: that the nephritis comes on slowly and insiduously and not as a rule discovered until the disappearance of the tonsillar affection. It may develop without noticeable symptoms and may suddenly become most alarming without marked warning. We have all, no doubt, noticed the close relationship between acute amygdalitis and rheumatic affections and our clinical experience leaves little doubt of the importance of this organ in such diseased conditions. It is also a matter of clinical observation that most of the exanthematous diseases may be ushered in by acute inflammation of the faucial tonsils and in all it is often a most distressing symptom. Not only is the general health of the individual influenced by diseased states of the tonsils, but the ill effects are also noticed upon the ear. The submerged tonsil, where it is enlarged upward and backward, may produce sufficient pressure upon the eustachian tube to interfere with its blood supply and the proper ventilation of the middle ear, which will sooner or later cause a disturbance of its function.

Enough, I think, has been said to show the baneful influence of diseased tonsils and that they are a menace to the general health and mechanically affect the special sense of hearing. It would appear from the foregoing paragraphs that this close relationship had been clearly shown and if so, it becomes imperative upon us, as practitioners of medicine, to heed this warning and examine the throats of our patients carefully for diseased conditions of the tonsils, which may influence the general economy, and if any evidence of such is present, their complete removal is indicated; no "clipping" or half re-

moval will suffice. The gland must be removed in its entirety to accomplish the end we are striving for, viz: to avoid or shut out further infection through this channel; and only by a complete removal can we hope to accomplish this and prevent our patient from further infectious processes in and around the tonsils, such as tonsillar and peritonsillar abscess; and the absorption of other infections.

The modern method of operating is called a tonsillectomy; that is, a complete removal of the tonsil with its capsule intact. The writer's method of doing this in children is to administer a general anæsthetic (ether), and when anæsthesia is complete, the patient being in a prone position, the mouth is held open by a Jansen mouth gag, my position is on the right of the patient and with the right index finger the anterior pillar of the corresponding tonsil is quickly separated. After this separation is *correctly* started, it is an easy matter to follow it upward over the tonsil and then down along the posterior pillar to the base. The tonsil then hanging loose except at its base, is grasped with a Richards tonsil forceps, the ordinary tonsillotome, without the fork, is slipped over the handle of the grasping forceps, the loose tonsil pulled through the ring and the small attachment at the base severed. In this manner one is able to completely enucleate the gland so that not a vestige of tonsil tissue remains and that is what we should strive to accomplish in every case, for if a case is an operable one we should put forth our best efforts to remove every part of the diseased organ. Of the operation in the adult, I will only say it is done under local anæsthesia, the separation made usually with some form of tonsil separator instead of the finger. The other part of the operation being just the same. This, to my mind, is the ideal operation, but there are some difficulties to be overcome in the technic and dangers to be avoided, of which I will speak briefly. In starting the separation with the finger, a beginner is apt to force it into the tonsil tissue, instead of getting outside the capsule. This is to be deprecated, as it tears and rips the tonsil, which very much complicates the removal; in fact, in some cases makes it almost impossible. Another point of much importance is to avoid using too much force in attempting the separation, thus guarding against tearing the pillars of the fauces and subsequent contraction in healing. Be sure the tonsil is completely separated before cutting it off, otherwise the upper part may be severed, leaving the base. Contrary to the experience of many operators, the writer has found post-operative hæmorrhage in children more frequent after tonsillectomy than tonsillotomy. About 1½ per cent. in 200 cases. The contrary is true in adults. There is also decidedly more reaction following enucleation than after partial removal; the patient's throat remains quite painful for about one week; sometimes longer.

In conclusion I want to make an appeal to the

profession to correct the idea that the removal of the tonsils is a simple operation and devoid of danger, for it is not, as anyone who is constantly working in this field must admit. It has its dangers and no one should attempt this work without keeping this fact well in mind and being fully prepared to meet any emergency.

PELVIC SURGERY IN RELATION TO PERIODIC HEADACHES AND NEURALGIA.*

By H. P. GROESBECK, M.D.,
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BY the term "periodic headaches" we intend to convey the idea of headaches occurring at the time of menstruation, or immediately before or after, as well as the typical cases of hemicrania which are so termed.

Very little has been written of late concerning the relation between the condition of the pelvic organs and the occurrence of headache or neuralgia of the fifth nerve and there seems to be a great dearth of reports touching upon the various operations upon the pelvic viscera as a cure or relief of such headaches.

A large number of text books never even mention malposition of the uterus, cervical tears, hypertrophies, etc., as a cause of headache and perhaps as great a number barely consider it possible.

Most writers mention menstrual headache without even attempting to explain the cause.

The idea of pelvic lesions causing headache attracted considerable attention several years ago but, whether from an unwise selection of cases for operation or from a faulty technic in operating, it has seemed in recent years to have fallen into undeserved disrepute.

Of course there are cases of menstrual headache which would not be relieved and others which would be positively harmed by a hasty and ill-advised operation but, on the other hand, there are doubtless cases which would not only be benefited but absolutely cured by a well chosen operation.

The most severe, and practically all the worst, cases of menstrual headache or neuralgia occur in women who have borne children. Nullipara are comparatively free from the severe types although this is not always the case.

A family history of headaches or neuralgias is often obtainable.

The headaches, in women who have borne children, begin at varying intervals after the child is born and usually increase in intensity gradually until they become after a few years very severe and resist all known methods of treatment and often the patient becomes a victim of the morphine habit. This is a very common class of pa-

tients in the experience of every general practitioner.

Two theories have been promulgated and commonly advanced to explain the method by which pathological conditions of the pelvic viscera may cause headache:

1st. The vaso-motor theory which supposes the headaches to be caused by vaso-motor changes due to the pelvic disease and to the coincident disturbance of the pelvic circulation.

This hypothesis is very insufficient to explain the cases of headache which are cured by removal of apparently normal ovaries and where there is no other demonstrable pelvic lesion.

2nd. There has long been considered a sympathetic connection between the pelvic organs and various nerves, especially the cranial nerves, and certain neuralgias and headaches have been believed to be reflexly due to disease of the uterus, ovaries or tubes. This reflex action seems to be exerted most often at the menstrual periods when the pelvic organs are engorged with blood.

This idea of reflex action may be tenable, but would it not be perhaps less visionary to blame a faulty or unphysiologic internal ovarian secretion for the irritation of the nerves?

Could not the internal secretion of the ovaries contain some toxic substance due to imperfect functioning of the glands or could it not be lacking in some normal neutralizing substance the lack of which is caused by diseases or imperfect development?

In either case the internal secretion, while circulating in the blood, would irritate the nerves, causing pain, and these outbreaks would coincide with the menstrual periods when a large amount of the internal secretion is formed due to the blood engorgement and consequent increased activity of the ovaries.

I wish to emphasize the fact that we mean an internal secretion faulty, not as to increase or diminution in amount, but as to quality and composition. In this case the exhibition of ovarian extract would theoretically not improve the symptoms and this seems to be practically true, at least in the majority of cases.

Of course we cannot explain why this faulty secretion exhibits a selective action for the cranial nerves, neither do we know why gout prefers to lodge in the great toe rather than the little toe or why the scarlatina micro-organism displays an affinity for the kidney in preference to the liver.

I state the internal secretion theory on account of some recent findings of apparently normal pelvic organs in association with menstrual neuralgias and three cases of my own, which I shall mention later, where no disease of the ovaries could be discovered and in one of which the removal of the ovaries relieved a very severe and obstinate hemicrania of many years standing.

Without doubt the internal secretion theory

* Read before the Medical Society of the County of Schenectady, October 17, 1911.

will not hold water when we consider the cases of menstrual headache cured by correcting any pelvic congestion, or by other means except removal of the ovaries, unless we consider that any pathological pelvic condition reacts on the ovaries, either by the circulation or the nerves, causing imperfect functioning and an abnormal secretion.

Thus the removal of an hypertrophied and congested cervix may relieve a slight congestion in an ovary, which upon examination is apparently healthy, and thereby restore the internal secretion to normal.

Perhaps the following three cases will exemplify what I have had to say:

CASE I.—Mrs. D., age 35, born in United States, occupation housework, family history negative, has always been well, no severe illness, previous menstrual history good, had one child, a boy, five years ago.

About one and one-half years ago began to have frontal headaches and a "blurring of vision" as she described it. The attacks came on at irregular intervals, but were always worse just before and during each menstruation. Consulted oculist—procured glasses—headaches continued. Complained of leucorrhœa and slight bearing down pains low in the pelvis.

Vaginal examination showed profuse leucorrhœa, slight uterine retroflexion and bilateral laceration of the cervix with hypertrophy of lips and erosion.

Operation, August 19, 1911—curettage and trachelorrhaphy. Since operation no bearing down pains and no headache.

In this case it is easy to conceive how the congested cervix may have reacted on the ovaries causing imperfect functioning which was corrected by relieving the congestion in the cervix.

CASE II.—Mrs. A., age 31, born in United States, occupation housework, family history negative, has always been well until boy was born fourteen years ago, previous menstrual history good.

As near as she can remember, two or three years after the boy was born she began to have slight occipital headaches and eyeaches at the time of menstrual periods. Procured glasses with no relief. Headaches gradually increased in severity, consulted several oculists, glasses changed, still no relief.

Afterward had complete physical examinations by different men of established competence—nothing pathological found by any of them.

Patient has no other symptoms besides headache which is intense, frontal, sometimes also occipital, accompanied by vomiting, menstrual in point of time and relieved only by hypodermics of morphine which have been administered (only by her physician) for several years.

For past few months the headache has occurred not only during but between the menses.

For nearly a year she has been under the care

of a well known neurologist who promised a cure but has obtained no results so far.

Patient has, to date, refused removal of ovaries.

I mention this only as a type case in which, according to our hypothesis, double oöphorectomy would seem to offer the only chance of a complete cure.

CASE III.—Mrs. S., age 44, born in United States, occupation housework. Mother had frequent headaches and one of two sisters has severe headaches at irregular intervals. Otherwise family history is good.

Patient has always been of a nervous disposition and has had slight headaches as long as she can remember. When menstruation became established, at age of 14, her former headaches became regular and occurred at time of menstruating, gradually increasing until she was married, at age of 19 years. Menstruation was always regular, with slight abdominal pain, and lasted five to six days.

Seven years after marriage, eighteen years ago, her first child was born and three years later another.

After her first pregnancy the headaches took on the type of migraine lasting at first only a few hours and in later years three to seven days.

About two years after second child was born she had a perineorrhaphy and ventral suspension performed. Infection followed and she was in the hospital for two months seriously ill and afterwards in bed at home for six weeks.

About four years ago had a severe attack of iritis and conjunctivitis lasting four months after which she was never able to see sufficiently well to walk alone on the street.

After that her periodic headaches became worse; she had to wear colored glasses and any attempt at reading or any bright light precipitated an attack. Since then, until her operation, she lost about twenty-five pounds and became progressively weaker.

When her second child was two years old (thirteen years ago), her physician began to use morphine hypodermically to control the hemi-crania at every menstruation. The dose was necessarily gradually increased until; at time of operation recently, one and one-half grains at a dose was necessary to relieve her suffering and sometimes even that amount failed. Patient has never had the use of the syringe and has never taken the drug by mouth.

Three years ago her headaches were very severe, began a day or two before menstruation and lasted four or five days. At this time removal of the ovaries was advised but refused, as she thought she was too weak to survive the operation.

The pain always began in the right eye and was at all times confined to right side and back of head, was neuralgic in character, very intense and accompanied by vomiting during the first two or three days.

The agony was intense and the patient at times exhibited acute mania, tossed herself out of bed, threw her glasses on the floor, talked irrationally and tore her hair.

Twice a day a hypodermic of one grain morphine and one one-hundredth of hyoscine was necessary and this was gradually increased until six months ago patient was taking one and one-half grains morphine, b. i. d. At night she never slept without 90 grains bromide and 40 grains chloral by rectum.

In the intervals between attacks patient had very little appetite and was very constipated. The appetite would gradually just return and food begin to be retained when time for menstruation came around and another attack commenced.

The interval between attacks lessened and about a year ago the hemicrania began to occur between as well as during the menstrual period. She lost weight rapidly, became very weak and between December and the latter part of June, six months, the headache and nausea became almost continuous and she was unable to leave her bed—an existence so miserable that the sufferer prayed daily that it might be terminated and her misery ended.

Operation was again advised and this time consented to by the patient as a last resort.

On June 23, 1911, the abdomen was opened under ether anæsthesia.

The uterus was found fixed to the anterior abdominal wall as a result of operation thirteen years ago, and a small fibroid, the size of an English walnut, on the posterior surface removed. Both tubes and ovaries were apparently normal except for a few cysts. Other abdominal and pelvic organs apparently normal. The appendix was removed, double salpingo-oöphorectomy performed and the abdominal wall sutured without drainage.

Convalescence was rapid, appetite and strength began to return after first week and headache disappeared at once. There was even no ether nausea and patient felt more comfortable during that first week than at any time during the preceding six months.

For the first two days following operation patient received one and one-half grains morphine twice a day, the next three days one and one-half grains once a day, the next two days hypodermics of sterile water once a day and since June 30th, seven days after operation, patient has had absolutely no morphine or opium in any form and has not suffered from its discontinuance.

This is rather a quick withdrawal for a patient who has taken morphine for thirteen years in increasing doses and for six months previous to operation three grains every day. Of course she had pangs of morphine hunger at times for the first three weeks but has not asked for it since.

Two weeks after operation patient went home and began to sit up in a chair, had no headaches,

but complained of head feeling queer and full at times. Two or three times since, after entertaining and talking with a number of visitors or after trying to use her eyes beyond the limit, she has had a slight headache lasting only a few hours but since operation has had no hemicrania and no vomiting. In fact, she says that the relief is remarkable and that the feeling of comfort and well being is almost unbelievable after so many years of suffering. She relishes her food and eats better than ever before and has gained about twenty pounds.

Although the results in this case are all that could be desired, I do not mean to advise a hasty removal of both ovaries in every case of menstrual headache, but I do believe it should be done at least as a last resort after all other attempts at cure have failed and in cases where cessation of menstruation is preferable to the terrible monthly suffering of neuralgia or hemicrania.

This paper is offered simply as a preliminary report of an idea which, indeed, may be found to have little in it, or which, if elaborated and made use of, may be the means of relieving suffering womanhood of one of its many burdens.

PRECAUTION TO BE TAKEN IN MAKING THE BENZIDINE TEST FOR OCCULT BLOOD IN A TEST MEAL.

By DR. SAMUEL FLOERSHEIM,
NEW YORK.

THE benzidine test for the detection of occult blood in a test meal is the latest and most sensitive so far devised. To a good history and physical examination, repeated affirmation of occult blood in a test meal is productive of strengthening a diagnosis of gastric ulceration. Therefore it is imperative that we make sure of our tests before we venture to give a definite diagnosis.

Some months ago a patient suffering from a protracted form of gastric disturbance was referred to me, by her physician, for diagnosis and treatment. A minute history was taken and a careful physical examination made. There was nothing in the history or in the physical examination to direct one's attention towards gastric or duodenal ulceration, but in order to complete the examination, the following test meal was ordered:

On Sunday—Take no medication of any kind. At 6.30 A. M. sharp eat a breakfast consisting of six stewed prunes and ten raw raisins, a little cereal and unsweetened black tea or coffee. Do not eat or drink anything between breakfast and the following:—

At 11:15 A. M. sharp, eat one waterroll or two slices of dry white bread and drink a tumbler and a half of cool water. Be at my office at 12 noon, notifying the nurse of the appointment and the test meal.

The test meal was aspirated at the one-hour period and examined in the laboratory. Surprise was pre-eminent when the benzidine test gave a positive reaction for blood. The aloin and guaiac tests did not show a positive test.

Believing that something went wrong or that the directions above given were not carried out as ordered, the test was again given with explicit orders for strict compliance. The patient presented herself at the proper time and gave assurance that the instructions given were faithfully carried out. Again the aspirated test meal gave a positive reaction to benzidine and a negative one to aloin and guaiac. A third test meal was productive of the same results.

A fourth test meal was then given as follows:

On ——day, take no medication. Eat a light breakfast consisting of bread, cereal, tea or coffee. At 10.30 A. M., eat a dry waterroll or two slices of dry white bread and drink a tumbler and a half of cool water. Be at my office at 11.15 A. M. and report as before.

Upon extraction, this test meal proved negative to all the three tests for occult blood. Two more tests of similar nature were made upon the same patient and each in turn proved negative to blood reaction in all three tests.

The cause was sought for this discrepancy. After many experiments were made in the laboratory, it was found that the prunes in the test would cause a distinct reaction for blood in the benzidine solution, while the aloin and guaiac solutions would not show this reaction. This was exactly as occurred in the test meals of the patient above described.

Over one hundred and fifty tests were made in the laboratory with different collections of prunes taken either from patients' stomachs and from the cupboard. In every instance a positive test for blood was obtained in the benzidine solution. Likewise every test proved negative to aloin and guaiac.

Immediately upon floating the ethereal extract of the prunes (prepared exactly as from a test meal) upon the ozonized benzidine solution, a cloudy field having a distinct greenish tinge was produced. The reaction in many of the tests would become marked within ten minutes; in other cases the distinct dark green reaction was obtained as early as half a minute while in still other experiments the reaction was delayed upwards of four hours. The different specimens of prunes gave quite different time reactions, but in every case and laboratory experiment a positive blood test was obtained.

It would seem from the foregoing that the prune contains a substance which reacts to benzidine, hence the precaution that should be taken. We are familiar with the fact that rice, milk and potatoes react to benzidine and further precautions in this direction need not be alluded to.

Further experimentations were directed to the other content of the test meal—the raisin—to

obtain its activity, if any, upon the blood-testing solutions. On floating the ethereal extract upon the benzidine solution, as in the prune tests, the characteristic cloudy field was obtained, but the immediate green tinge, deepening to a dark shade within a short time, was not observed. After thirty or more minutes standing, there was a distinct green discoloration to the super-imposed ethereal extract, but not of sufficient intensity to cause any conflict with the blood test. After many hours of standing, the benzidine solution turned to a much darker green. The aloin and guaiac solutions were not affected by the raisin extract.

THE TYPHOID STATE.*

By W. N. MacARTNEY, M.D.,
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GENTLEMEN:

“MANY a time and oft,” to use a somewhat weather-beaten phrase, I have been called in consultation over some typhoid case in say the third week of the fever, to find the patient lying on his back, to a greater or less extent oblivious of his surroundings, fever-flushed, emaciated to a degree, with cracked lips, dry tongue, sordes on his teeth, a drum-like, distended and tympanitic abdomen. Diarrhoea is usually present; he has a muttering delirium, a small pulse, scanty urine, twitching muscles, possibly flexed and rigid arms and a retracted neck, mayhap carphologia and coma-vigil. “Such a condition,” say Pepper and others, “is fitly termed the typhoid state,” and it is this condition to which I will strive to confine my remarks, inasmuch as the subject of typhoid fever as a whole is far too extensive for the limits of this paper, and its general treatment will not be discussed. The attending physician seems to take it for granted that this condition is a necessary concomitant of a certain proportion of typhoid cases and the text-books bear him out in this belief. In fact, he not uncommonly feels as proud over having such a severe and “typical” case of typhoid as the Scotchman who swore with vigor and fluency in the presence of the bishop. The bishop said to him, “Man! man! where *did* you learn to use such language?” “Hoot! Mon!” replied the Scot, “You caan’t larn it; ’tis a gift!”

We must always make allowance for the other’s point of view. It seems to me that the so-called “typhoid state” is not an essential phase of the disease but the logical and legitimate result of an inefficient line of treatment; of a failure to recognize and appreciate the principles which should underlie the treatment of an infectious fever of this type, principles which should maintain at least until such time as we shall fully work out a specific sero-therapy which will en-

* Read at the annual meeting of the Fourth District Branch of the Medical Society of the State of New York, at Ogdensburg, October 10, 1911.

able us to handle the disease in a wholly different way, a problem for which we all hope there will be a satisfactory solution in the immediate future. "Tis a consummation devoutly to be wished."

It has been my custom in these cases to see that the patient gets without delay an ounce of Epsom salts or two or three ounces of castor oil, usually to the horror and unqualified disapproval of the nurse in charge, and I not infrequently have to reassure the attending physician by assuming all responsibility for the effect of such a dose. When, instead of the alarming prostration which he feels sure will follow the administration of such a heroic dose to a patient in this desperately depressed state he finds his patient at his next visit phenomenally improved, he arrives usually with commendable promptness, at one of two decisions. One is that he has had some light thrown upon the immediate cause of the typhoid state. The other may be that he has merely witnessed another remarkable example of fool luck. Which of these diametrically opposed conclusions he arrives at is largely a matter of individual temperament. This we cannot presume to alter and therefore must abide in patience and such serenity as we may possess. If the Lord intended us all to see things in exactly the same way He would doubtless have made us all five feet nine inches in height, slightly choleric in disposition, and Scotch-Irish Presbyterians—like myself. He doesn't seem to have done so.

We are all quite familiar with the common manifestations of typhoid. We all recognize it as a specific infectious disease, characterized by ulceration of the intestinal lymph glands, by a peculiar exanthem, by a continued fever, by marked abdominal symptoms with enlargement of the liver and spleen, and a general invasion of the system by the bacillus of Eberth. While gastric, cerebral or pulmonary symptoms may in a given case predominate, I think we are all prepared to admit that the two salient features of the vast majority of cases are the continued fever and the abdominal symptoms, while all others are, relatively speaking, of secondary or minor importance. From this clinical standpoint we may, for the sake of clarity, class all the various symptoms, multitudinous as they are, into a few groups.

To begin with the febrile group. The fever lasts on an average 28 days. Some cases as we all know are abortive and run a much shorter course. On the other hand some run a much longer time. I had one case which had a continuously high fever for sixty-five days without remission, before she finally recovered. There was no question of the exact duration of the fever, or of the diagnosis, since I had been treating several other cases of the disease in the same household when she contracted it. Another case ran fifty-seven days without sign of break. Still

another case had the usual twenty-eight days of fever, a week of apparent convalescence, a relapse of three weeks duration, another interval of a week, a two weeks run of fever, and finally a recurrence of one week, after which, much to my relief, he stayed well. He was getting on my nerves.

Primarily, we should expect to find with a fever of such duration and intensity, marked shrinkage in body weight, dry lips, fissured tongue, sordes on the teeth, urine of high specific gravity, a small pulse, scanty secretions, due in a large measure directly to the drying up of the body fluids from the prolonged and continuous high temperature.

Again, since the primary focus is admittedly in the digestive tract and the chief culture tube some thirty odd feet in length, loaded with culture media obviously favorable to the rapid growth of immense colonies of germs, we should expect to have another group of symptoms, disturbances of digestion, constipation or diarrhoea, tympanites, meteorism and abdominal distention, and under this head at times, as a result of the accompanying ulceration, those dreaded complications, hemorrhage or perforation.

It would seem obvious that a third group of symptoms such as headache, photophobia, deafness, and later, hebetude, stupor, muscular rigidity and twitching, the pseudo-meningeal symptoms, the low delirium, carphologia and coma-vigil are the direct and logical result of absorption of intestinal toxines poisoning the nerve centers. In fact, it is quite reasonable to assume that the fever itself is due to disturbances of the heat centers of like character.

On the other hand doubtless the various complications involving other organs are due to the localization of other and secondary cultures at points distant more or less from the primary focus, giving rise to pneumonia, parotitis, periorchitis, etc.

To recapitulate, we have those symptoms due chiefly to the high temperature per se, the evidences of a seething fermentative process in the abdominal sewer, those symptoms attributable to an intoxication of the nervous system, and those due to secondary invasion of other organs and tissues.

Since the treatment of typhoid is as yet essentially symptomatic we may deal with these symptom groups in the order named, and the indications seem clear and logical. As Thistle of Toronto pointed out very lucidly in 1893, the treatment should be in the main eliminative. This is accomplished by active purgation together with the administration of large quantities of fluids. The emaciation, the drying up of the body fluids, the scanty secretions, can be successfully combated only by the ingestion of large amounts of fluids, wherefore, if for no other reason, the use of liquid nourishment should be insisted on, in order to counteract the desiccating effect of pro-

longed high temperature. As a matter of fact, in view of the very large percentage of water in the body as a whole, the loss of weight is akin to that of the dried apple, not necessarily a loss of tissue, and when liquids are given in sufficient quantity, together with sufficient nourishment, it is astonishing how little loss of weight occurs.

I am in the habit of giving to adults from two to three litres of water in the 24 hours. These patients are apathetic, they do not like to be disturbed, and often object to so much water, but I assure them they are lucky that they don't have to take something that tastes worse. If I find at any time that the urine is of high specific gravity, or scanty, or the tongue shows the slightest indication of dryness, I order more water and yet more, until the tongue moistens and the urine is plentiful. Water will not hurt them. It will *not* derange digestion by diluting the gastric fluids. Any reasonable amount is safe—if they can swim. The way to put out fire is with water, and plenty of it. The way to control fever is to use water. And the place to turn on the hose is not on the surface but where the fire is. Not on the rose rash, but on Peyer's patches.

The second indication is elimination, the clearing of the intestinal tract of the vast colonies of germs. Not once, by giving an initial dose of calomel as so many writers recommend, but daily, following the banner of our energetic friend Abbott of the Alkaloids: "Clean out, clean up, keep clean." There seems to be a wide-spread fear throughout the profession in regard to giving purgatives in typhoid, an ever-present dread of exhaustion from over-purgations, of hemorrhage, or perforation, from increased peristalsis. This I believe to be utterly without warrant. My belief is based upon a long and extensive experience in giving many different purgatives to all sorts and conditions of typhoid cases. I have been in the habit of insisting on free purgation every day *during the height of the fever*, to the extent of three or four movements per diem if not more, together with a sufficiency of water by the mouth, and, since I have adopted this method of treatment I have no more hemorrhages or perforations. Nor have I ever observed exhaustion from over-purgation. At first I followed this method in fear and trembling but I have outgrown this and the bogey-man no longer affrights me. On the other hand, free purgation without the giving of adequate quantities of water to replace the fluids evacuated will only assist the desiccating process already inaugurated by the continuous fever.

In my judgment the worst thing that the practitioner of medicine can do for any case of typhoid flux, or for that matter, for any case of acute dysentery or diarrhœa, is to give an astringent or any similar remedy to "check" the discharge. It is criminal interference with Nature's methods and I figure that a few million children have been sacrificed in this way. With

free purgation your typhoid diarrhœa ceases. You cannot get more than two pints of peas out of a quart measure, neither can you get intoxicated from an empty flask. You cannot have a typhoid diarrhœa when the intestinal tube is thoroughly cleared, nor intestinal toxæmia from an empty bowel. In fact, the chief trouble I have in this line is in getting the bowels to move every day with sufficient freedom, from any reasonable dose of purgatives, which is what you would naturally expect as the result of repeated catharsis.

Moreover, with the clearing of the digestive tract you do more than clear out the fecal debris and masses of bacteria. You carry out a lot of unabsorbed toxins. In addition to this you start a serous flow from the vessels and lymphatics so abundant in this region, into the bowel, carrying with it much of those poisons previously absorbed and diluting the remaining poisons in the blood, lessening their concentration, by means of the water taken into the stomach or given with the colon tube.

As regards the cathartics to be used I have little to say. I am advocating certain general principles, not the use of any specific agents. I have used castor oil and salts extensively, cascara, certain non-irritant pills, compound licorice powder, mineral waters and numerous other purgatives not drastic in nature, with the utmost freedom. It is results I am after and the purgative is merely the means to an end. One thing is to be remembered. When your horse is in fine fettle and fresh from the stable a cluck of the tongue and a flip of the lines is sufficient to make him strike his best gait. But floor him with distemper or an attack of pleuro-pneumonia and it may take sharp commands, vigorous punching, and even manual assistance by the caudal extremity to even get him on his feet, and the dose which might act as a brisk cathartic to a person in health may be utterly ineffective when given to him during an attack of some serious malady. A dozen small movements may be no indication that your cathartic has acted thoroughly, but two or three voluminous and malodorous stools constitute much better evidence. Err if necessary on the side of generosity (I am not speaking here of irritant cathartics like croton oil), and give dose enough. If an ounce of castor oil were proven to be in a given case an ample dose to clear out the bowels and you in an excess of zeal should give three ounces there need be no cause for apprehension. You will merely find the unnecessary two ounces on the top of the last stool.

Given free catharsis and the fever subsides to a large extent, while the symptoms of intestinal toxæmia referred to are promptly ameliorated. With a fever of 102 or 103 I order a brisk cathartic, more purgatives, more water. For many years I have not found it necessary to resort to external bathing in these cases, once I had the bowels thoroughly evacuated and washed, save

as a matter of comfort and cleanliness or to induce sleep. As we are all aware, in private practice the Brand baths are difficult to carry out, particularly in the absence of a trained nurse, and they are uncomfortable to the patient who often becomes rebellious. I have yet to see a case of typhoid in which, after the patient had been under treatment 24 hours the tub bath seemed indicated. Nor have I seen a case of hyperpyrexia from this or any other cause in which I could not reduce the temperature to any desired degree by the sponge bath alone, properly administered. I say properly administered for I believe the failure to reduce temperature more than a degree or two by sponging is due to faulty technique, due to a failure to appreciate the physical law which controls its action. The tub bath lowers the temperature by direct cooling and abstraction of heat through contact. This occurs to a very limited extent also in cold sponging. Personally I do not use cold sponging in these cases, but warm sponging. However, it is not so much a question of soft or hard nose bullets as of penetration and direct aim.

In hot climates, in the absence of ice, it is a common custom to suspend porous jars containing drinking water in some breezy place under the shade of a tree. It is a well-known physical law that water during evaporation absorbs a large amount of heat which in the vaporous form becomes latent and the surface of the porous jar being constantly moist, evaporation takes place rapidly and the water in the jar becomes cool. A similar process occurs when you exercise sufficiently to induce perspiration. This is Nature's way of reducing excessive bodily heat. If this principle is definitely borne in mind in giving a sponge bath, if the entire body of the patient is freely exposed to the air, and by energetic work on the part of the attendant, the entire surface is kept thoroughly moistened so that in the presence of the high fever rapid evaporation takes place, I have never failed to secure all the reduction in temperature I could desire, and for this purpose warm water is practically as effectual as cold and far more agreeable to the patient.

In hemorrhage, threatened or actual, many writers recommend lead and opium. I can see no objection to adrenalin though I have had no occasion to use it for this special purpose, but I would hesitate a long time before I used lead and opium or Monsel's, or in fact, any other astringent, in such a case. You have infected ulcers to deal with, ulcers liable to necrosis, perforation, hemorrhage from sloughing or erosion. It is directly contrary to general surgical principles to use astringents, to pen up foul secretions, in order to control sloughing, extension of necrotic processes or hemorrhage resultant therefrom. Is it not in better accord with ordinary surgical knowledge to cleanse your raw surfaces gently and freely from time to time as best

you may, and to use as you would with a superficial ulcerative process such antiseptic measures in general as are indicated? But the final word is, as regards typhoid hemorrhage, that prevention is better than more or less ineffectual attempts to cure.

This mention of antiseptics leads us to the third general indication for treatment, intestinal antiseptics. Personally, I would not claim that we can secure anything like absolute asepsis of the entire alimentary canal by any safe means as yet known, and I believe that the use of antiseptics in these cases is practically of little avail so long as the bowels are distended with large accumulations of decomposing food wherein the bacillus of Eberth and other organisms can find an excellent culture medium, free from disturbance, at exactly the proper temperature for their incubation.

You cannot destroy these immense colonies of activity multiplying bacteria by any safe dosage of intestinal antiseptics, in my judgment. But I do believe that, given repeated purgation, plenty of diluents, intestinal lavage, given thorough and repeated washing and rinsing of the bowel, and the use of reasonable doses of intestinal antiseptics will inhibit the growth of the remaining bacilli and accomplish a practical if not absolute sterilization of the tract, precisely as we do in infected surgical lesions elsewhere, in this way preventing to a large extent secondary invasions of other regions. Here we are following general surgical measures in that the most efficient way known of preventing secondary infections is to cleanse and disinfect as best we may the primary focus. Destroy the main camp and trust to Nature's forces to pick up the skirmishers.

For this purpose I have tried numerous much-vaunted antiseptics and germicides, but of late years I have relied upon two agents, salol and iodized phenol. I do not claim that they are the best because for all I know, others may be still better, but I have found them acceptable to the patient, effectual, and inexpensive. The salol is of course practically tasteless, while the iodized phenol is not disagreeable and is an excellent remedy in those cases where nausea and vomiting are troublesome. Two teaspoonfuls of a mixture of equal parts of carbolic acid and tincture of iodine added to a pint of water, dessertspoonful every two hours, representing practically one minim of each agent to the dose, is my routine procedure. I have yet to see any evidence of carboluria from these doses, a fact which I attribute to the diluent effect of the large quantities of water ingested, and the active elimination induced.

In conclusion I merely wish to reiterate my belief that the so-called typhoid state is not an essential part of typhoid but of a mismanaged typhoid, that the symptoms referred to under this head are not symptoms of typhoid fever but may result from other conditions of intestinal toxæmia

attended with continuous fever, and the above treatment is not to be construed as covering the treatment of typhoid fever as a whole. On the other hand adherence to the three principles of treatment outlined constitute a logical and successful treatment of the typhoid state, pending the full fruition of the present-day research in the line of vaccines and sero-therapy, and certain theories which are now on the firing line.

PRESIDENT'S ADDRESS.*

By EDITH W. STEWART, M.D.,

HUME, N. Y.

BEFORE entering into the detail of my subject, I wish to thank the members of the County Society for the honor and distinction which they have seen fit to confer upon me during the past year. It has certainly been very gratifying to me, the only feminine representative of the medical profession in the county and county society, to receive the kindness and consideration which has ever been meted out to me at your hands.

Realizing to the fullest capacity, the private opinion which the average medical man bears toward the average medical woman, I think we can congratulate each other upon the turn events have taken. Congratulations for the feminine contingent for the honor and recognition of her sex in the medical world bestowed by her masculine colleagues. Congratulations for the masculine element, in that it is capable of casting aside private opinion and matters of prejudice, of broadening and expanding beyond the average, and placing at the head of the society, without solicitation or desire on her part, its only woman member.

It has been most pleasing to me to be thus recognized; and I have enjoyed arranging the programs and conducting the meetings, and have derived many benefits from my year of regular attendance and co-operation with you. I desire also to express my appreciation of the manner in which the members have responded to any request to furnish subject matter to make the meetings of interest, and have aided, by their attendance, in adding zest, and energy, and life, and a spirit of royal good fellowship to the meetings which have been held during the past year. Do as much or more for the years which are to come!

I am certain that you will join me in extending a vote of thanks to the members of the fraternity, outside the society, who from time to time have helped to make the meetings of interest during 1911. And we especially thank Dr. Jones for the valuable article he has presented today.

Now, still keeping in mind the subject of growth and expansion, it seems that upon

this occasion it will be apropos to dwell upon the practice of medicine sixty or sixty five years ago. Longer than the lifetime of the majority of us gathered here today, yet not so many years after all. Just as far back as my father's time, the older ones remark. Just as far back as when my grandfather was in his prime, say I. Yet what advances have been made in medical science during these sixty years! My grandfather made many of his own tinctures, fluid extracts, various tonics and all his own pills. In many instances he was obliged to gather his own roots and herbs and furnish the crude materials.

In the earlier days of his practice he traveled on horseback, and dispensed from his saddle bags, by the light of a tallow candle, his home-made pills, powders and decoctions, and often they proved a nauseous dose. He was a doctor of the old school; and many a weary night did he pass in vigil by the bedside of some patient who lay in the valley of the shadow, comforting by his presence, quieting by his remedies, and by his skill and judgment in nursing, keeping alive that vital spark called life. His was the day of the canal boat, the stage coach, the turnkey, the empirical formulæ, when quinine was weighed out most accurately and a grain was considered a maximum dose—when morphine was something new under the sun and there was no literature on the subject, and my grandfather and a consultee procured a quantity of the precious powder, and after an hour of due and grave deliberation, in which they brought to bear the most accurate light upon the subject, they decided that a grain of the important substance would be a fitting dose for a small sufferer of five years; and he slept the eternal sleep, ignorant of the grievous error they had committed. The day when the ice-cap, the hot water bag, the hypodermic syringe, the clinical thermometer, and the stethoscope were yet unevolved and undeveloped; and our now obsolete bulb syringe had never been. Against what odds he must have labored, yet he saved life and was loved and revered of his people. Now we have our fully equipped pharmaceutical laboratories, manned with an efficient corps of chemists, graduate pharmacists, and scientific investigators who are constantly producing new combinations, new chemical formulæ, active principles and alkaloids of many drugs, tonics pleasant to the taste, and tablets without number, pleasing to the eye. The much-maligned and sometimes rejected drug agent calls frequently, and we often consider it a task to spend a half hour in ordering from his varied stock, goods that are delivered at our doors without further annoyance to ourselves, by express or fast freight. We have our drug stores in every town and can prescribe largely. We have trained nurses at our command who carry out our orders and relieve the nervous tension; efficient consultees who aid

* Delivered before the Medical Society of the County of Allegany, at Belmont, October 12, 1911.

by wide experience and scientific training. We can, with comparative ease and rapidity, transport our patients to a near-by city for surgical treatment and hospital care. Our offices are electric lighted, and furnace or steam heated. We have our telephone which brings us into closer relation with our patient and his condition and saves us many a weary mile of travel. We have discarded to a certain extent our horses and carriages and have converted into positive pleasure by the use of the automobile, many a hard day's ride over the hilly roads, through the heat and dust.

Ours is the day of progress; of wireless telegraph, of aeroplane, of swiftest travel by land and sea, of daily newspapers and medical literature galore, of microscopical and X-ray apparatus and many electrical appliances, of aseptic surgery, of local and general anesthesia, of pathological and bacteriological laboratories, of condensed oxygen, of serum therapy, of tuberculosis sanitariums and open air treatment, of organized campaign against disease and its causative factors, of rational therapeutics, of complete analyses of blood, sputa, and human excretory products. And yet withal, we have much to learn, for medical knowledge along certain lines is still in an embryonic stage. Some of the older men present today can recall vividly the many, many isms and theories they have had to unlearn and forget, and the modern lines of thought and treatment they have had to meet and grapple with. So will it be with the younger members in their turn. We must all be able to put aside old ideas and theories, and broaden and expand as the years of growth and development roll along. Yet let us not be too ready to discard the old and adopt the new.

Even now we have faulty systems. There is a tendency in this age of progress to think less for ourselves, to let the other man size up the situation for us. It is easier. There are many things to distract our attention. We dislike to sacrifice self.

Keep ever in sight the fact that old mother nature is the same in the generations to come as she was in the generation which has passed. Let us be her diligent students and able imitators, master her art and remember that she resents interference; that even though patient and long suffering, she will win out in time. Bear in mind that in each individual case there is a deep underlying cause which we are to search for, detect, and remove if possible. Let us mix our conservatism and our liberality in *q. s.* that they may balance in a perfect equation.

None of us do the best we know how; for that would be an unnatural and strenuous existence, but let us all do the best we can under the circumstances and conditions which surround us. Let us do good, thorough, honest, conscientious work for ourselves and our fellow men, accepting as our example the doctor of 60 years ago who was ever faithful to his trust.

PRESIDENT'S ADDRESS.*

By J. H. MARTIN, M.D.,

BINGHAMPTON, N. Y.

LACK OF APPRECIATION AND NEGLECT OF OPPORTUNITY AND THE HANDWRITING ON THE WALL.

GENTLEMEN:

IN the early days of the settlement of America, the physicians were foreign born and educated either in London, Dublin or Edinburg. As the population increased, more physicians were needed and young men were apprenticed to the doctor, who also did more or less surgery, the student assisting in the care of the horse, office, collecting, drying, preserving, and compounding the herbs for the use of the doctor's books and his instructions. Later, perhaps, a course of lectures in Europe, as there was nothing of the kind here. As the time rolled along the population increased, civilization extending farther and farther toward the West. A medical college was established in 1767.

In 1750 Drs. Bard and Middleton, of New York City, for the purpose of instructing young men who were then engaged in the study of medicine, dissected the body of a criminal who had been executed. In 1770 Dr. Ezekiel Hersey, of Hingham, Mass., left \$4,000 to be used to establish a Professorship of Anatomy. Dr. John Warren, of Boston, gave a series of lectures on Anatomy in 1780 and 1781, he having been a surgeon in the Continental army. In Philadelphia, Drs. Ralph Asheton, Christopher Witt, John Edmonds and Phineas Bond, were well known teachers and gave instructions to many young men. Kings College gave lectures in Anatomy in 1763, and its board voted to establish a regular medical school, August 14, 1767.

The College of Philadelphia organized a medical faculty in September, 1765, and Harvard College took similar action in 1782. Kings College, afterwards Columbia College and later Columbia University, was created by letters patent issued by George II, King of England, October 31, 1754. In 1763 lectures on anatomy were given at the college by Dr. Samuel Clossey, a graduate of Trinity College, Dublin. The following are the names of physicians that comprised the medical faculty of Kings College in 1767:

Samuel Clossey, M.D., Professor of Anatomy.

Peter Middleton, M.D., Professor of Physiology and Pathology.

John Jones, M.D., Professor of Surgery.

James Smith, M.D., Professor of Chemistry and Materia Medica.

Samuel Bard, M.D., Professor of Theory and Practice of Physics.

John V. B. Tennant, Professor of Midwifery.

* Read before the Broome County Medical Society, October, 3, 1911.

This college opened in November, 1767, and its first graduates were Robert Tucker and Samuel Kissam, 1770 and 1771. Thus Kings College was the first medical school in America to confer the degree of M.D. The College of Physicians and Surgeons of New York is a part of Columbia College. As population increased and cities began to spring up other medical colleges were established. The requirements to become a medical student were a common school education, a good moral character, and two courses of lectures of four to six months, usually twenty weeks, and your diploma from the college was sufficient authority to practice medicine anywhere in the United States, and yet the absence of the diploma did not prohibit one from practicing medicine, as after the County Medical Societies were formed the Board of Censors had the authority to issue a license to practice medicine in that county and in that county only.

In the earlier days of the writer, were a number of aged physicians practicing medicine in the county under the county license, and they were good, faithful practitioners and took a great interest in medical meetings. At this time quackery had not gotten the foothold in this country that it now has, though some physicians were practicing who had never completed a course in a medical college but had perhaps taken one course of lectures and perhaps done some dissecting out of college, but these men were not called quacks, in the meaning of the term as now used.

In 1876 some physicians in New York City saw the necessity of a school where physicians could return and brush up for a few months or so, and a post-graduate school was organized, and one college that had a college quiz that cost \$50 to attend, and at that time there were a number of medical students that could not afford to take the course, so the faculty began to get wise and concluded to make the course free and give a more severe final examination, as they began to see the necessity of turning out better physicians. Soon a three- and a four-year course was called for, and at the present time the writer knows of no school but what it requires four years to complete the course. There is an Association of Colleges, and nearly every medical college belongs to the association and their course of study is nearly alike, and yet some colleges have gone still farther and want the student before he enters to have a degree, while all require an education equal to a regents certificate or high school diploma. So far so good; but when they began to raise the requirements of entrance and increased the number of years to complete a course, humbuggery and quackery began to increase, as there were those who could not or did not want go through the regular course, began to look about for some other means of reaching the public; hence, we have the various denominations in the field all ready to cure the public of their many ills with as little previous education and prepara-

tion as possible, to fool the public and get their money. Now all the advancement made along the line of hygiene and prevention of diseases have been done by the physicians themselves at their own detriment insofar as dollars go, but how could this be otherwise when we are the guardians of the health of the people and our duty as physicians is to prevent disease as well as to relieve those who are diseased, even though at times we are thrown overboard and a quack substituted. And here is where the people lack appreciation.

Now there are others who lack appreciation as a knowledge of the membership of our State Medical Society will show. There are in New York state 14,117 physicians, and only 6,885 members of the State Medical Society. In our own local societies all the physicians are not members, yet I know of no reason why they should not be. These societies are open to all regular graduates of medicine. Our attendance has not been what it should be, and I am sorry to say that it is the younger and youngest medical men and members who are absent. Although most of them are members they are seldom seen at our meetings. As one of our younger physicians said to me while speaking of the meetings, "They did not amount to anything." Well, that was news to me, for I thought they were instructive. I am sure we have had good men here from other cities on different subjects. Men who were qualified to address us, and yet our younger members were conspicuous by their absence. Now, I believe that it pays to be a member of both our local societies and to be active members. It pays in various ways. For those who look upon the financial side of it, I will say for the benefit of such that I know of a young physician who lost \$150 plus this last season by not being an active member of Broom County Medical Society, and I know of another who made \$150 plus by being a member and an active one. Now, \$150 is not to be overlooked. It would pay a good many years' dues and buy a tire or two for an auto, but there are other and greater reasons for being members and active members of our local societies. If a member of the County Society, one is also a member of the State Society, and if a member of the State Society you are eligible to membership in the American Medical Association. As a member of the State Society you get the journal of the Society and the directory, and in addition the state furnishes you with a lawyer to defend you in case of malpractice, and that is something that confronts every physician that practices his profession. Even cases for malpractice have already been brought for using 606. It is by a better acquaintance among the profession that broadens one's mind and those little mean feelings and jealousies disappear when we come to meet each other in our meetings, for there is nothing like a heart to heart talk to settle differences in opinion.

The way to make our medical meetings amount to something is for everyone to contribute their mite as it is not only the scientific paper that awakens the most interest, but the discussion of the paper, diseases and cases that follow and often a sentence or a single word will awaken a train of thought that if followed up will let a flood of light in where it was dark before. So instead of belittling the societies, let everyone push and don't be afraid to cut office hours if need be for you can treat patients when you will not always have a medical meeting to attend.

Our neglect of opportunity is when we do not make the best of what we have; keep in touch with each other, as we will find someone who can give us light on obscure points if we will only ask questions. But we cannot ask questions if we are absent, always bearing in mind that it is impossible for one head to contain all the knowledge, and a combination of heads is better than a single one. Another object and benefit of membership and organization is to further legislative matters pertaining to ourselves and the public; also to oppose such legislation when inimical to ourselves and the public, by presenting a solid medical front to the enemy.

What is the handwriting on the wall? From now on the practice of medicine will not be what it has been in the past, for old things have passed away and become as new. Medicine has assumed a more certain and scientific entity, and the public are reading up on many things and asking questions and some of them very pointed. Bacteriology has made great revelations. The use of various serums and vaccines are pushing themselves into use. The various instruments used for diagnostic purposes require considerable knowledge to use them and to interpret their meaning. "Ever remembering that success inevitably comes to those doctors who apply themselves assiduously, give the best that is in them and treat their patients squarely."

HUNTINGTON'S CHOREA.*

By L. C. LEWIS, M.D.,
BELMONT, N. Y.

EARLY in the last century Dr. Huntington, then a rural practitioner on Long Island, described several cases of a disease of the nervous system characterized by irregular motions, disturbances of speech and gradual dementia. This disease later became known as Huntington's Chorea. This name is rather unfortunate, as it has no connection with the more common Sydenham's Chorea. The salient points in connection with the disease are its late onset, the associated psychological symptoms and its hereditary nature.

* Read before the Medical Society of the County of Allegany, at Belmont, N. Y., October 12, 1911.

The disease is rare. Hamilton in an article in the *American Journal of Insanity*, May, 1908, was able to collect reports of twenty-seven cases. Dr. Putman, of Buffalo, in his long experience as a neurologist, writes me that he has seen but two cases, these two being brothers.

The hereditary character of the disease is very striking. Huntington's father and grandfather, also physicians, had treated the disease in the families which he describes and it is reported that the disease is still appearing in the same families at the present day. It does not usually appear in all members of a family, and when a member escapes his descendants are usually free from the disease. However, in some cases reported epilepsy or hysteria has appeared in one generation and the disease reappeared in the next generation.

The age of onset is late; the disease rarely appears before the 30th or 35th year. Men and women are equally affected. The first phenomena often follows some emotion.

The cardinal symptoms of the disease are the motor phenomena. Irregular movements usually first appear in the hands or face, and the patient notices difficulty in performing the more delicate manipulations. When well established the movements are slow, irregular and incoördinate, rather than sharp and quick, as in Sydenham's Chorea. In well developed cases the gait is erratic, the trunk rocks and the patient advances irregularly, now rapidly now slowly, or may take a few steps and then come to a sudden stop. By exercise of the will the patient may, however, repress all involuntary motions. The motor strength remains intact. The deep reflexes are increased. The mental weakness appears early, but progresses very slowly, ending frequently in idiocy. Depression is present, leading in many cases to suicide. There is usually no involvement of the sensory system.

The case which I wish to report is a male, white, fifty years of age, living in Allegany County, N. Y. About six years ago he noticed some difficulty in using his hands and feet. The condition appeared in both the upper and lower extremities at about the same time. Involuntary motions later appeared in both the lower and upper extremities and in the face. Mental weakness first became noticeable about two years after the onset of the disease, and has developed very slowly. At the present time the patient keeps some part of his body almost constantly in motion. These motions, however, are not quick and erratic, but rather slow. The eyes have the appearance of being protruded. The gait is peculiar; the patient may take a few steps rapidly, then a few slowly, and sometimes comes to a complete stop. There is considerable incoördination in the use of the upper extremities. The patient has the appearance of giving much mental effort to the act of walking. The sensory

system is normal. There are no bladder symptoms. There are occasional attacks of indigestion. Otherwise the internal organs are normal. There is some anemia, the reading being about 80 on the Tallquist hæmoglobin scale. The mental processes are very weak and slow and there are alternating periods of excitability and depression. One of the periods of depression led to an attempt at suicide.

The family history is very interesting. The members of this family have long recognized that they are liable to some disease of the nervous system, although a diagnosis of the trouble had never been made. The patient had two brothers and one sister. An older brother after suffering for many years with the same symptoms completely lost his reason and finally died from the disease. A younger brother shows the condition but to a much less extent. The sister is neurotic but has never shown any of the motor symptoms or mental weakness. The patient's mother died of pneumonia at the age of sixty, after suffering for many years with the symptoms described above. In her later years her motor symptoms and her mental enfeeblement were much more marked than in the patient at the present time. Several members of the family say that the maternal grandfather had what they call "the family nervous trouble," but details of his symptoms are not available. In the collateral branches, with the exception of one first cousin, the history is not available. This cousin has all the symptoms suffered by the other afflicted members of the family, but to a much more marked extent. She seems to be the most advanced case of any of the present generation.

From the motor symptoms, the progressive mental enfeeblement and the family history, I think we can in this case safely make a diagnosis of Huntington's Chorea. At the beginning the case was diagnosed by a physician as tabes. For six years he has believed he was suffering from that disease. It seems to me that among general practitioners there is a tendency to diagnose diseases of the nervous system, accompanied by difficulty in the use of the lower extremities, as locomotor ataxia, without sufficient data. I need not speak of the unfortunate consequences to a patient that may follow an incorrect diagnosis; but the fact that locomotor ataxia has become recognized by the laity as a syphilitic disease gives us reason to be especially careful. A number of years ago I was often asked, "Is not locomotor ataxia sometimes caused by syphilis?" Now I am asked, "Is not locomotor ataxia always caused by syphilis?" An inadvised diagnosis of locomotor ataxia may brand an innocent man as syphilitic.

The prognosis of Huntington's Chorea is bad. It is an incurable disease. The individuals finally become bed-ridden and die from some intercurrent disease or from cachexia. The usual duration is from ten to thirty years.

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PRELIMINARY PROGRAM.

106TH ANNUAL MEETING TO BE HELD AT
ALBANY, APRIL 16, 17 AND 18, 1912.

ARRANGED BY THE COMMITTEE ON SCIENTIFIC WORK.
Leo. H. Neuman, Chairman, Albany, N. Y.
Henry L. Elsner, Syracuse, N. Y.
Thomas J. Harris, New York City.
And the Officers of the Sections.

BY-LAWS, MEDICAL SOCIETY OF THE STATE OF NEW
YORK, CHAPTER X, SECTION 2.

"All papers read before the Society by its members shall become the property of the Society. Permission may be given, however, by the House of Delegates or the Committee on Publication to publish such paper in advance of its appearance in the NEW YORK STATE JOURNAL OF MEDICINE."

GENERAL PROGRAM.

TUESDAY, APRIL 16TH, 11 A. M.

Emmanuel Baptist Church. General Meeting open to the public.

Invocation by the Rev. Alexander H. Abbott, Pastor Emmanuel Baptist Church.

Opening Remarks by the President, Wendell C. Phillips, M.D., New York City.

Address of Welcome, by Hon. John A. Dix, Governor of the State of New York.

Address of Welcome, by Hon. James B. McEwan, Mayor of Albany.

Greetings from the American Medical Association. Abraham Jacobi, M.D., President-Elect, New York City.

Annual Oration on Medicine—"Relation of Exact Science to Medicine." Harvey W. Wiley, M.D., Chemist and Chief, Bureau of Chemistry, Department of Agriculture, Washington, D. C.

1 P. M.

Subscription luncheon (50 cents), German Hall.

2.30 P. M.

Meeting of Five Sections.

Section on Medicine—City Hall, Common Council Chamber.

Section on Surgery—City Hall, Supervisors' Room.

Section on Mental and Nervous Diseases, Eugenics and Medical Expert Testimony—Historical and Art Society Rooms.

Section on Public Health and Preventive Medicine—Emmanuel Baptist Church.

Section on Diseases of Eye, Ear, Nose and Throat—Albany Medical College.

8.30 P. M.

State Capitol, Assembly Chamber. General Meeting, Open to the Public.

ADDRESSES ON

Prevention of Blindness and the Instruction of the Blind Child—George E. de Schweinitz, M.D., Philadelphia, Pa., by invitation.

Prevention of Deafness and the Instruction of the Deaf Child—G. Hudson Makuen, M.D., Philadelphia, Pa., by invitation.

Prevention of Insanity—Albert Warren Ferris, M.D., Watkins.

Prevention of Tuberculosis—Homer Folks, Esq., State Charities Aid Association, New York, by invitation.

WEDNESDAY, APRIL 17TH.

9 A. M.

Meeting of Sections.

2 P. M.

General Meeting, Emmanuel Baptist Church.

Annual Oration on Surgery—The Duty of the Family Physician in the Management of Surgical Cases—John M. T. Finney, M.D., Assoc. Prof. of Surgery Johns Hopkins University, Baltimore, Md.

3 P. M.

Meeting of Sections.

JOINT SESSION—SECTIONS ON MEDICINE AND EYE, EAR, NOSE AND THROAT.

City Hall, Common Council Chamber.

SYMPOSIUM ON VERTIGO.

See Programs of Sections on Medicine and Eye, Ear, Nose and Throat.

8 P. M.

State Capitol, Assembly Chamber. General Meeting. Open to the Public.

Oration—"The Benefits of Vivisection to Mankind," Walter B. Cannon, M.D., Professor of Physiology, Harvard Medical School.

9 P. M.

Reception to the President—Entertainment, Dancing and Supper, Hotel Ten Eyck. Tickets, including supper, \$2.00.

THURSDAY, APRIL 18TH.

9.30 A. M.

Meeting of Sections.

Joint Session—Sections on Medicine and Surgery.

City Hall, Common Council Chamber.

Symposium on Poliomyelitis (Infantile Paralysis).

Symposium on Hyperthyroidea.

See Programs of Sections on Medicine and Surgery.

2 P. M.

Meeting of Sections.

SECTION PROGRAMS.

The order of reading papers will be in accordance with the printed program.

SECTION ON MEDICINE.

Chairman, Henry L. Elsner, M.D., Syracuse.

Secretary, Harold Barclay, M.D., New York City.

Place of Meeting—City, Hall, Common Council Chamber.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. A Clinical Study of Relapses in Typhoid Fever—Herman F. L. Ziegel, M.D., New York City.

2. Congestion of the Liver—Benjamin W. Stearns, M.D., Unadilla.

3. Vaccine Therapy in Medicine—T. Wood Clarke, M.D., Utica.

4. Graphic Methods in the Diagnosis of Heart Lesions, with Illustrations—Leo H. Neuman, M.D., Albany.

5. The Signs of Overdosage in Digitalis Administration—Walter A. Bastedo, M.D., New York City.

6. The Physical Treatment of Arterial Hypertension—Edward C. Titus, M.D., New York City.

7. Hydrotherapy and Mechano-Therapy of Arterio-Sclerosis—John M. Swan, M.D., Rochester.

8. The Significance of an Acid Gastric Juice in the Fasting Stomach—Harold Barclay, M.D., New York City.

9. Hyperacidity—George R. Lockwood, M.D., New York City. Discussion introduced by Maurice Gross, M.D., New York City.

10. The Water-trap Stomach, its Diagnosis and Treatment—G. Reese Satterlee, M.D., New York City; Leon T. Le Wald, M.D., New York City.

WEDNESDAY, APRIL 17TH.

9 A. M.

11. Toxæmia of Pregnancy, a Consideration of Treatment—William M. Brown, M.D., Rochester.
12. Treatment of Typhoid Carriers—Frederick M. Meader, M.D., Syracuse.
13. The Results of the Early Diagnosis of Urinary Tuberculosis—Walter F. Braasch, M.D., Rochester, Minn., by invitation.
14. Relative Value of Air, Food and Rest in the Treatment of Pulmonary Tuberculosis—Lawrason Brown, M.D., Saranac Lake.
15. The Value of Digitalis and Arsenic in the Treatment of Pulmonary Tuberculosis—Abraham Jacobi, M.D., New York City.
16. Title to be announced—Alfred Stengel, M.D., Philadelphia, Pa., by invitation.
17. Clinical Vagaries in Certain Forms of Liver Disease—Nathan E. Brill, M.D., New York City.
18. The General Care of an Emphysematous Patient—William M. Gibson, M.D., Utica.
19. Cardiac Sequelæ of Tonsillar Infection—Joseph R. Wiseman, M.D., Syracuse.
20. Title to be announced—Solomon Solis Cohen, M.D., Philadelphia, Pa., by invitation.
21. Eczema in Infants and Young Children—Charles G. Kerley, M.D., New York City.

3 P. M.

JOINT SESSION OF THE SECTIONS ON MEDICINE AND EYE,
EAR, NOSE AND THROAT.

SYMPOSIUM ON VERTIGO.

For Section on Medicine:

22. Vertigo from the Standpoint of the General Practitioner—Charles G. Stockton, M.D., Buffalo.
23. Vertigo Due to Lesions of the Central Nervous System—Joseph Collins, M.D., New York City.

For Section on Eye, Ear, Nose and Throat:

- Vertigo Due to Ocular Causes—Percy Fridenberg, M.D., New York City.
- Labyrinthine Vertigo—Philip D. Kerrison, M.D., New York City.
- Vertigo Due to Middle-Ear Causes—James F. McKernon, M.D., New York City.
- Discussion to be opened by John E. Weeks, M.D., Arthur B. Duel, M.D., Francis Valk, M.D., Edward D. Fisher, M.D., New York City; Thomas H. Farrell, M.D., Utica, and Joseph A. Kenefick, New York City.
24. Further Studies on Endocarditis—Edward C. Rosenow, M.D., Chicago, Ill., by invitation.
25. The Relation of the State to Medical Education—John L. Heffron, M.D., Syracuse.
26. A Medical Sociological Study—Walter H. Kidder, M.D., Oswego.

THURSDAY, APRIL 18TH.

9.30 A. M.

JOINT SESSION OF THE SECTIONS ON MEDICINE AND
SURGERY.

SYMPOSIUM ON POLIOMYELITIS (INFANTILE PARALYSIS).

For Section on Medicine:

27. Pathology—George Draper, M.D., New York City.
28. Symptoms, Difficulties and Possibilities in Early Diagnosis—R. Foster Kennedy, M.D., New York City.
29. The Acute Stage—Francis W. Peabody, M.D., New York City.
30. Medical Treatment—David E. Hoag, M.D., New York City.

For Section on Surgery:

- Prevention and Correction of Deformities by Mechanical Treatment—Wisner R. Townsend, M.D., New York City.
- Surgical Treatment—Henry Ling Taylor, M.D., New York City. Discussion opened by Rufus I. Cole, M.D., Rockefeller Institute, New York City. Smith Baker, M.D., Utica; L. Pierce Clark, M.D., New York City.

This symposium is based largely on the recent experiences (clinical and pathological) from the Hospital of the Rockefeller Institute.

SYMPOSIUM ON HYPERTHYROIDÆA.

Perverted Thyroid Function.

For Section on Medicine:

31. Symptomatology—George Dock, M.D., St. Louis, Mo., by invitation.
32. Atypical Types—Alexander Lambert, M.D., New York City.
33. Pathology—William C. MacCarty, M.D., Rochester, Minn., by invitation.
34. The Medical Treatment—S. S. Beebe, M.D., New York City.

For Section on Surgery:

- The Surgical Treatment—Martin B. Tinker, M.D., Ithaca.

2 P. M.

35. The Influence of Respiration on the Pulse Rate—Robert H. Halsey, M.D., New York City.
36. Syphilis of the Stomach—Jerome Meyers, M.D., Albany.
37. Alopecia Areata—Paul Bechet, M.D., New York City.

SECTION ON SURGERY.

Chairman, Parker Syms, M.D., New York City.
Secretary, James N. Vander Veer, M.D., Albany.
Place of Meeting, City Hall, Supervisors' Room.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. Surgery of the Battlefield—Surgeon General George H. Torney, U. S. Army, by invitation.
2. Old Dislocations of Shoulder and Elbow, Surgical Treatment of—Lucius W. Hotchkiss, M.D., New York City.
3. Treatment of Simple Fractures by the Open Method—John B. Walker, M.D., New York City.
4. Treatment of Simple Fractures by the Closed Method—James M. Hitzrot, M.D., New York City.
Discussion opened by Arthur W. Eltinge, M.D., Albany; Samuel Lloyd, M.D., New York City; Ralph R. Fitch, M.D., Rochester.
5. Lateral Curvature of the Spine—Walter Truslow, M.D., Brooklyn, New York.
6. Operations in Potts Disease—Russell A. Hibbs, M.D., New York City.
Discussion opened by Charlton Wallace, M.D., New York City; Clarence E. Coon, M.D., Syracuse.
7. X-Ray Pictures of the Urinary Tract—Henry D. Furniss, M.D., New York City.
8. X-Ray Pictures of the Kidney—Edward L. Keyes, Jr., M.D., New York City.

WEDNESDAY, APRIL 17TH.

9 A. M.

9. Suprapubic Prostatectomy—Paul M. Pilcher, M.D., Brooklyn.
10. Cancer of the Prostate—Eugene Fuller, M.D., New York City.
Discussion opened by Nathan Jacobson, M.D., Syracuse.
11. Rupture of the Kidney in Children—Charles L. Gibson, M.D., New York City.
12. Intestinal Injuries, due to Contusion of the Abdomen—Gilbert D. Gregor, M.D., Watertown.
13. Bismuth Paste (Beck's Paste) Its Therapeutic Uses in Surgery—Emil G. Beck, M.D., Chicago, Ill., by invitation.
14. Gastric and Duodenal Ulcers—Indications for Operation—Grant C. Madill, M.D., Ogdensburg.
15. A Plea for Early Diagnosis in Surgical Affections—Alvah H. Traver, M.D., Albany.
16. Epithelioma of the Eyelids—S. Busby Allen, M.D., Patchogue.

3.00 P. M.

- 17. Surgery of the Bile Ducts—John B. Deaver, M.D., Philadelphia, Pa., by invitation.
- 18. Biliary Colic without Gall Stones—Irving S. Haynes, M.D., New York City.
- 19. Control of Hemorrhage in Operations upon the Liver—Burton J. Lee, M.D., New York City.
Discussion opened by Joseph D. Bryant, M.D., New York City.
- 20. Constipation, Surgical Aspects of—Samuel S. Gant, M.D., New York City.
- 21. Prolapse of the Rectum, a New Operation for—Alexis V. Moschowitz, M.D., New York City.
Discussion by Dwight H. Murray, M.D., Syracuse.

THURSDAY, APRIL 18TH.

9.30 A. M.

JOINT SESSION OF THE SECTIONS ON MEDICINE AND SURGERY.

SYMPOSIUM ON POLIOMYELITIS (INFANTILE PARALYSIS).

For Section on Medicine:

- Pathology—George Draper, M.D., New York City.
- Symptoms, Difficulties and Possibilities in Early Diagnosis—R. Foster Kennedy, M.D., New York City.
- The Acute Stage—Francis W. Peabody, M.D., New York City.
- Medical Treatment—David E. Hoag, M.D., New York City.

For Section on Surgery:

- 22. Prevention and Correction of Deformities by Mechanical Treatment—Wisner R. Townsend, M.D., New York City.
- 23. Surgical Treatment—Henry Ling Taylor, M.D., New York City.
Discussion opened by Rufus I. Cole, M.D., Rockefeller Institute, New York City; Smith Baker, M.D., Utica; L. Pierce Clark, M.D., New York City.

This symposium is based largely on the recent experiences (clinical and pathological) from the Hospital of the Rockefeller Institute.

SYMPOSIUM ON HYPERTHYROIDEA.

Perverted Thyroid Function—

For Section on Medicine:

- Pathology—William C. MacCarty, M.D., Rochester, Minn.
- Symptomatology—George Dock, M.D., St. Louis, Mo., by invitation.
- Atypical Types—Alexander Lambert, M.D., New York City.
- The Medical Treatment—S. S. Beebe, M.D., New York City.

For Section on Surgery:

- 24. Surgical Treatment—Martin B. Tinker, M.D., Ithaca.

2 P. M.

- 25. Induction of Labor at Term—George Kosmak, M.D., New York City.
- 26. The Use of Fœtal Serum to Cause the Onset of Labor—Abraham J. Rongy, M.D., New York City.
- 27. Abdominal Cæsarian Section, Indications for,—Ross McPherson, M.D., New York City.
- 28. Prolapse of the Uterus—Its Surgical Treatment—Charles Clifford Barrows, M.D., New York City.
- 29. Uterine Fibroids Complicating Pregnancy—Ralph Waldo, M.D., New York City.
- 30. Cancer of the Uterus, Radical Operation for—Le Roy Broun, M.D., New York City.
Discussion by John A. Sampson, M.D., Albany; Willis E. Ford, M.D., Utica; Wm. Seaman Bainbridge, M.D., New York City.

SECTION ON DISEASES OF THE EYE, EAR, NOSE AND THROAT.

Chairman, Edward Bradford Dench, M.D., New York City.
Secretary, James Francis McCaw, M.D., Watertown.
Place of Meeting—Albany Medical College.

TUESDAY, APRIL 16TH.

2.30 P. M.

- 1. Chairman's Address—Edward B. Dench, M.D., New York City.

SYMPOSIUM ON THE CAUSES OF DEAFNESS.

- 2. Deafness as a Result of Diathetic and Constitutional Conditions—Sargent F. Snow, M.D., Syracuse.
- 3. Deafness as a Result of Middle-Ear Suppuration—Samuel J. Kopetzky, M.D., New York City.
- 4. Deafness as a Result of Otosclerosis—John E. Sheppard, M.D., Brooklyn.
- 5. Deafness as a Result of Congenital, Traumatic and Toxic Causes—Arthur G. Root, M.D., Albany.
Discussion to be opened by John B. Rae, M.D., Gorham Bacon, M.D., New York City; W. Scott Renner, M.D., Frank W. Hinkle, M.D., Buffalo; Thomas H. Halsted, M.D., Syracuse; John L. Adams, M.D., New York City; Bradford A. Richards, M.D., Rochester.
- 6. Tinnitus Aurium, Its Significance in Certain Diseases of the Ear—Edmund P. Fowler, M.D., New York City.
Discussion to be opened by W. Sohler Bryant, M.D., and George F. Cott, M.D., Buffalo.
- 7. Modern Surgery of the Tonsil—Thomas H. Halsted, M.D., Syracuse.
Discussion by Thomas J. Harris, M.D., New York City; John O. Roe, M.D., Rochester; W. Scott Renner, M.D., Buffalo, and Robert C. Myles, M.D., New York City.
- 8. Palate and Lip Surgery, Aims and Results—Truman W. Brophy, M.D., Chicago, Ill., by invitation.

WEDNESDAY, APRIL 17TH.

9 A. M.

- 9. Occupational Diseases of the Eye—Ward A. Holden, M.D., New York City.
- 10. Occupational Diseases of the Ear, Nose and Throat—W. Sohler Bryant, M.D., New York City.
Discussion by Ellice M. Alger, M.D., New York City; John E. Sheppard, M.D., Brooklyn; Frank E. Miller, M.D., Herbert W. Wootten, M.D., New York City.
- 11. Effects of Salvarsan on the Eye—Robert G. Reese, M.D., New York City.
- 12. Effects of Salvarsan on the Ear—Charles E. Perkins, M.D., New York City.
Discussion on both papers to be opened by John A. Fordyce, M.D., Emil Gruening, M.D., Arthur B. Duel, M.D., New York City, and Clement F. Theisen, Albany.
- 13. Some Cases Illustrating Ocular Disturbances Due to Disease of the Nose and Accessory Sinuses—John E. Weeks, M.D., New York City.
- 14. The Optometry Law—Frank Van Fleet, M.D., New York City.

3 P. M.

JOINT SESSION OF THE EYE, EAR, NOSE AND THROAT SECTION WITH SECTION ON MEDICINE.

SYMPOSIUM ON VERTIGO.

- For Section on Medicine:
 - Vertigo Due to General Diseases—Charles G. Stockton, M.D., Buffalo.
 - Vertigo Due to Diseases of the Central Nervous System—Joseph Collins, M.D., New York City.
- For Section on Eye, Ear, Nose and Throat:
 - 15. Labyrinthine Vertigo—Philip D. Kerrison, M.D., New York City.
 - 16. Vertigo Due to Middle-Ear Causes—James F. McKernon, M.D., New York City.
 - 17. Vertigo Due to Ocular Causes—Percy Fridenberg, M.D., New York City.
Discussion to be opened by John E. Weeks, M.D., Arthur B. Duel, M.D., Francis Valk, M.D., Edward D. Fisher, M.D., New York City; T. H. Farrell, M.D., Utica, and Joseph A. Kenefick, New York City.

THURSDAY, APRIL 18TH.

9 A. M.

SYMPOSIUM ON THE CAUSES OF BLINDNESS.

- 18. Blindness as a Result of Inflammatory Disease Affecting the Conjunctiva—Coleman W. Cutler, M.D., New York City.

19. Blindness as a Result of Intraocular Disease—Edgar S. Thomson, M.D., New York City.

20. Blindness Due to Toxemia—Arnold Knapp, M.D., New York City. Discussion by Lucien Howe, M.D., Buffalo, and Walter E. Lambert, M.D., New York City; F. Park Lewis, M.D., Buffalo; Charles H. May, M.D., New York City; G. Griffin Lewis, M.D., Syracuse; A. Edward Davis, M.D., Walter B. Weidler, M.D., New York City.

21. Some Common Results of Eye Strain—William R. Broughton, M.D., New York City.

Discussion by George T. Stevens, M.D., Percy Fridenberg, New York City, and Julius H. Kevand, Syracuse.

22. An Optimistic View of Migraine—Ellice M. Alger, M.D., New York City.

Discussion by Sherman Voorhees, M.D., Elmira; Ward A. Holden, M.D., New York City; William G. Dobson, M.D., Poughkeepsie.

23. Some Ocular Observations in Brain Tumor—Sherman Voorhees, M.D., Elmira.

Discussion by Peter A. Callan, M.D., New York City; John H. Claiborne, M.D., New York City.

2 P. M.

24. The Surgical Management of Nasal Accessory Sinus Disease—Lewis A. Coffin, M.D., New York City.

25. (a) Acute Frontal Sinusitis with Orbital Perforation and Meningitis. Operation—Recovery.

(b) Chronic Frontal Sinusitis with Erosion of Inner Cranial Plate and Extra Dural Abscess. Operation—Recovery—Seymour Oppenheimer, M.D., New York City.

Discussion on above papers opened by Cornelius G. Coakley, M.D., H. Beaman Douglass, M.D., New York City; Stephen H. Lutz, M.D., Brooklyn; T. Passmore Berens, M.D., William K. Simpson, M.D., H. Holbrook Curtis, M.D., Harmon Smith, M.D., New York City.

26. Exhibition of Sections of Temporal Bones. Dry Specimens Showing the Nasal Accessory Sinuses—William M. Dunning, M.D., New York City.

27. The Submucous Operation and Some of its Difficulties—Isaac M. Heller, M.D., New York City.

28. Keratitis Neuroparalytica after Removal of the Gasserian Ganglia—Walter B. Weidler, M.D., New York City.

29. Serum Therapeutics of Purulent Diseases of the Ear—Rene H. Huvelle, M.D., New York City.

SECTION ON MENTAL AND NERVOUS DISEASES, EUGENICS, AND MEDICAL EXPERT TESTIMONY.

Chairman, Albert Warren Ferris, M.D., Watkins.

Secretary, Edward L. Hanes, M.D., Rochester.

Place of Meeting—Historical and Art Society Rooms.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. Institutional Training of the Feeble-Minded—Charles S. Little, M.D., Supt., Letchworth Village, Thiells. Discussion opened by Henry H. Goddard, Ph.D., Supt. of The Training School, Vineland, N. J., by invitation.

2. Eugenics—Charles B. Davenport, Ph.D., Sec. American Breeders Association, Cold Spring Harbor, L. I., by invitation. Discussion opened by Aaron J. Rosanoff, M.D., Kings Park.

3. Primary Sources of Tuberculous Infection, and Their Relation to Eugenics—S. Adolphus Knopf, M.D., New York City.

4. Speech in Nervous Diseases; with lantern slide demonstration of voice records—Edward W. Scripture, M.D., New York City. Discussion opened by J. Ramsey Hunt, M.D., New York City.

5. Report of a Case of Acromegalia with Autopsy—Hermon C. Gordinier, M.D., Troy, and William Kirk, Jr., M.D., Troy. Discussion opened by Henry Hun, M.D., Albany.

WEDNESDAY, APRIL 17TH.

9 A. M.

6. Paralytic Complications of Migraine—J. Ramsey Hunt, M.D., New York City.

7. Some Therapeutic Considerations Based on the Pathogenesis of Epilepsy—L. Pierce Clark, M.D., New York City. Discussion opened by Thomas P. Prout, M.D., New York City.

8. Indications for Surgical Interference in Epilepsy—Edward A. Sharp, M.D., Buffalo. Discussion opened by Edgar R. McGuire, M.D., Buffalo.

9. Practical Results of Surgery in Epilepsy—C. Kirby Collier, M.D., Craig Colony, Sonyea. Discussion opened by J. F. Munson, M.D., Craig Colony, Sonyea.

10. Family Periodic Paralysis, With Report of Two Cases—Charles E. Atwood, M.D., New York City. Discussion opened by Edward B. Angell, M.D., Rochester.

11. Cerebral Abscess, with Presentation of Patient—LaSalle Archambault, M.D., Albany. Discussion by W. Seaman Bainbridge, M.D., New York City, R. Foster Kennedy, M.D., New York City, and Robert Lewis, M.D., New York City.

12. Hereditary Chorea—Evelyn P. Ballantine, M.D., Rochester. Discussion opened by Smith Ely Jelliffe, M.D., New York City.

3 P. M.

13. Subject to be announced—August Hoch, M.D., Director Psychiatric Institute, Ward's Island, New York City.

14. Dementia Præcox Deteriorations without Delusions or Hallucinations, a Type Most Frequent Outside of Hospitals—George H. Kirby, M.D., Director of Clinical Psychiatry, Manhattan State Hospital, New York City. Discussion by Morris J. Karpas, M.D., New York City.

15. Presenile Dementia (Alzheimer's Disease), with lantern slide demonstrations—Charles E. Lambert, M.D., Psychiatric Institute, Ward's Island, New York City. Discussion by Charles B. Dunlap, M.D., New York City.

16. Medical Work in the State Hospitals, and the Year's Report—Charles W. Pilgrim, M.D., Supt. Hudson River State Hosp., Poughkeepsie. Discussion by James V. May, M.D., President, State Commission in Lunacy, Albany, and Walter H. Kidder, M.D., Oswego.

17. Some Notes on the Compulsion Neuroses—Smith Ely Jelliffe, M.D., New York City. Discussion opened by A. A. Brill, M.D., New York City.

18. The Relation of Certain Educational Problems to the Topic of Insanity. C. Macfie Campbell, M.D., Bloomingdale Hospital, White Plains.

19. The Only Child, or Favorite Child in Adult Life—Abraham A. Brill, M.D., New York City. Discussion by Smith Ely Jelliffe, M.D., and Horace W. Frink, M.D., New York City.

THURSDAY, APRIL 18TH.

9.30 A. M.

20. Medical Expert Testimony from the Alienist's Standpoint—Carlos F. MacDonald, M.D., New York City. Discussion opened by Charles G. Wagner, M.D., Supt. State Hospital, Binghamton.

21. Medical Expert Testimony from the Lawyer's Standpoint—William A. Purrington, Esq., New York City, by invitation.

22. The Attitude of the Bench Toward Expert Testimony—Hon. Randall J. Le Boeuf, Albany, former Justice of the Supreme Court of New York, by invitation.

23. Regulation of Expert Testimony—Charles L. Dana, M.D., New York City.

24. The Medical Expert and the Proposed Changes in the Law Governing the Defense of Insanity in Homicide Cases—Arthur C. Brush, M.D., Brooklyn. Discussion by J. B. Ransom, M.D., Dannemora.

25. Nervous and Mental Symptoms Due to Disturbed Circulation, with Illustrative Cases, and Notes

on Treatment—Frank H. Stephenson, M.D., Syracuse. Discussion opened by B. C. Loveland, M.D., Syracuse.
26. Toxic Deliria; Report of Cases—Nishan A. Pashayan, M.D., Schenectady. Discussion by George H. Kirby, M.D., New York City, and Otto Kiliani, M.D., New York City.

SECTION ON PUBLIC HEALTH AND PREVENTIVE MEDICINE.

Chairman, Joshua M. Van Cott, M.D., Brooklyn.
Secretary, Allen Arthur Jones, M.D., Buffalo.
Place of Meeting—Emmanuel Baptist Church.
Open to the Public.

TUESDAY, APRIL 16TH.
2.30 P. M.

1. The Public Hospitals of New York State—Hon. Robert W. Hebbard, Secretary, State Board of Charities, by invitation.
2. Milk as a Factor in the Promotion of Public Health—Godfrey R. Pisek, M.D., New York City.
3. The Night Camp and its Place in Tuberculosis—H. Holbrook Curtis, M.D., New York City.
4. The Mineral Springs of Saratoga—George H. Fish, M.D., Saratoga Springs.
5. The Necessity of Examining Those Exposed to Pulmonary Tuberculosis—John H. Pryor, M.D., Buffalo.
6. The Rôle of the Dispensary and the Day Camp in the Anti-Tuberculosis Movement—George J. Eckel, M.D., Buffalo.

WEDNESDAY, APRIL 17TH.
9 A. M.

7. The Necessity of Trained Men in Public Health Work—Eugene H. Porter, M.D., Commissioner of Health, State of New York, New York City.
8. Tropical Medicine—Lieut. S. M. Shook, Medical Corps, U. S. Army, by invitation.
9. Tropical Climate and its Physiological Effects—Capt. James M. Phalan, Medical Corps, U. S. Army, by invitation.
10. Typhoid Prophylaxis—Major F. F. Russell, Medical Corps, U. S. Army, by invitation.
11. The Epidemiology of Typhoid Fever and its Relation to the Practitioner—Theodore Horton, C.E., Chief Sanitary Engineer.
12. The Early Use of Antitoxins—William S. Magill, M.D., Director State Laboratories, New York City.
13. Anaphylaxis—Benjamin White, M.D., Hoagland Laboratory, Brooklyn.
14. Prophylaxis in Diphtheria—Franklin C. Gram, M.D., Buffalo.
15. State vs. National Quarantine—Algernon T. Bristow, M.D., Brooklyn.
16. Public Health Work in Cities—Francis E. Fronczak, M.D., Buffalo.
17. Public Health Work in Rural Communities—Charles S. Prest, M.D., Waterford.
18. Public Health and Public Recreation—Luther H. Gulick, M.D., Russell Sage Foundation, New York City.
19. Public Health and the Child—Le Grand Kerr, M.D., Brooklyn.

THURSDAY, APRIL 18TH.
9.30 A. M.

20. To be announced—Medical Work in the Canal Zone.
21. Water Pollution—Henry R. Hopkins, M.D., Buffalo.
22. Pollution of the Harbor Waters of New York. Especially Referring to Bearing on Health—Linsly R. Williams, M.D., New York City.
23. Smallpox and Vaccination—Frederic C. Curtis, M.D., Albany.
24. Defective Eyesight in Children—Frederick J. Mann, M.D., Poughkeepsie.
25. Public Health Education Among Women—Cora B. Lattin, M.D., Ithaca.
26. Subject to be announced—S. Josephine Baker, M.D., Dept. Child Hygiene, New York City. Discus-

sion opened by Rosalie Slaughter Morton, M.D., New York City.

27. Certain Amendments to Articles 2 and 3 of the Public Health Law—William B. Hanbridge, M.D., Ogdensburg.

28. Possible Helps in the Control of the Black and White Plagues—Joseph Roby, M.D., Rochester.

2 P. M.

29. Observations on Industrial Hygiene with a Practical Method of Conserving the Vital Resources of Employees—Frederic W. Loughran, M.D., New York City.

30. The Significance of the Physician of Physiological Age—Charles W. Crampton, M.D., New York City.

31. The Social Evil—James Pedersen, M.D., New York City.

32. The Health Laws of New York—Frank Overton, M.D., Patchogue.

33. The Practicing Physician's Contribution to Public Health Work—William A. Howe, M.D., Deputy Commissioner of Health, Phelps.

Through the courtesy of the President State Board of Health, E. H. Porter, M.D., the laboratories of the State Department of Health will be open for inspection, and all members of the medical profession are cordially invited to the exhibit.

ANNOUNCEMENT.

Members are requested to secure accommodations in advance by writing to the hotels and boarding houses. If a member arrives at Albany without having secured accommodations, he should apply at once to the Committee on Registration and Information, which will be found at the Registration Booth in the City Hall.

HOTELS.

Ten Eyck, with annex; The Hampton; The Kenmore; Stanwix Hall; are managed on the European plan, with rooms ranging in price from \$1.50 per person up. Keeler's (for men only), rooms \$1.00 up; Globe, rooms from \$1.00 up; Am. plan, \$2.50. The Gainsborough; The Lodge, rooms from \$1.00 up.

BOARDING HOUSES.

M. Phelan, 1 Chestnut St.; F. A. Ingomire, 70 Chestnut St.; Mrs. E. F. Williams, 46 Chestnut St.; Mrs. Margaret Hartnett, 93 Columbia St.; Mrs. Mahar, 103 Columbia St.; Mrs. Thompson, 52 Dove St.; Mrs. D. H. Bolles, 66 Dove St.; Mrs. Dickerman, 66 Eagle St.; Mrs. Van Kleek, 66 Eagle St.; Mrs. Hamilton, 69 Eagle St.; G. D. Jones, 73 Eagle St.; Mrs. Katherine Lewis, 106 Eagle St.; Miss E. Graham, 101 Eagle St.; Mrs. E. A. Bailey, 131 Eagle St.; Mrs. J. N. Bondreau, 32 Elk St.; Mrs. Gilbert, 28 S. Hawk St.; Joseph W. Tessier, 34 S. Hawk St.; Mrs. N. E. Ferron, 62 S. Hawk St.; Mrs. L. C. Winhold, 72 S. Hawk St.; Mrs. S. M. Steigelman, 86 Hudson Ave.; Mrs. Richard N. Johnson, 135 Hudson Ave.; Mrs. I. J. Shafer, 136 Hudson Ave.; Mrs. N. Gibbons, 140 Hudson Ave.; Mrs. K. Toohey, 191 Hudson Ave.; Mrs. W. V. Johnstone, 197 Hudson Ave.; Mrs. G. E. Wilson, 222 Hudson Ave.; Mrs. Townsend, 228 Hudson Ave.; Mrs. W. Sweers, 246 Hudson Ave.; Mrs. Gallup, 254 Hudson Ave.; Franklin W. Scott, 275 Hudson Ave.; M. E. Hastings, 282 Hudson Ave.; Mrs. F. L. Harcourt, 304 Hudson Ave.; Mrs. D. Pollock, 305 Hudson Ave.; Mrs. Handigo, 318 Hudson Ave.; Mrs. L. L. Miller, 24 Hudson Ave.; Mrs. John Haas, 47 Jay St.; Mrs. B. Ijanes, 86 Jay St.; Miss J. Carr, 186 Jay St.; Mrs. L. H. Hathaway, 225 Jay St.; Mrs. J. A. Carroll, 6 Jefferson St.; Mrs. Jennie M. Long, 93 Jefferson St.; Mrs. D. Lowman, 32 Lancaster St.; Mrs. F. C. Stevens, 11½ Lancaster St.; Mrs. J. C. Haight, 86 Lancaster St.; Bertha L. Nuths, 71 Lancaster St.; C. M. Powers, 94 Lancaster St.; Mrs. W. L. Le Fevre, 99 Lancaster St.; Mrs. S. B. Smith, 163 Lancaster St.; The Lodge, 2 and 3 Lodge St.; Henry B. Wilkins, 12 Park St.; Mrs. Toombs, 16 Park St.; Mrs. Farley, 17 Park St.; Miss Tilton, 5 Pine St.; M. Bailey, 34 Spring St.; Mrs. W. N. Sullivan, 44 Spring St.; Mrs. H. Wrighton, 84 S. Swan St.; Mrs.

Frank H. Dans, 105 S. Swan St.; Mrs. McDermott, 154 S. Swan St.; Mrs. A. H. King, 12 Washington Ave.

SUGGESTIONS TO ENDORSING OFFICER OF MEETING IN
INSTRUCTING PERSONS IN ADVANCE RESPECTING
REDUCTION AUTHORIZED ON THE
CERTIFICATE PLAN.

A reduction of fare and three-fifths on the certificate plan from points in New York State has been secured for persons attending the meeting of The Medical Society of New York, Albany, N. Y., April 15th-18th.

The following directions are submitted for your guidance:

1. Tickets at the regular full one-way first-class fare for the going journey may be secured within three days (exclusive of Sunday) prior to and during the first two days of the meeting. The announced opening date of the meeting is April 15th and the closing date is April 18th, consequently you can obtain your going ticket and certificate not earlier than April 11th nor later than April 17th.* Be sure that, when purchasing your going ticket you request a certificate. *Do not make the mistake of asking for a receipt.*

2. Present yourself at the railroad station for ticket and certificate at least thirty minutes before departure of train on which you will begin your journey.

3. *Certificates are not kept at all stations.* If you inquire at your home station, you can ascertain whether certificates and through tickets can be obtained to place of meeting. If not obtainable at your home station, the agent will inform you at what station they can be obtained. You can, in such case, purchase a local ticket thence, and there purchase through ticket and secure certificate to place of meeting.

4. Immediately on your arrival at the meeting present your certificate to the endorsing officer, Dr. William I. Nellis, at Bureau of Information, City Hall.

5. It has been arranged that the Special Agent of the Trunk Line Association will be in attendance on April 16th, 17th and 18th, from 9 A. M. to 6 P. M., to validate certificates. *A fee of 25 cents will be charged at the meeting for each certificate validated.* If you arrive at the meeting and leave for home again prior to the Special Agent's arrival, or if you arrive at the meeting later than April 18th, after the Special Agent has left, you cannot have your certificate validated and consequently you will not get the benefit of the reduction on the home journey. *No refund of fare will be made on account of failure to have certificate validated.*

6. So as to prevent disappointment, it must be understood that the reduction on the return journey is not guaranteed, but is contingent on an attendance at the meeting of not less than 100 persons holding regularly issued certificates obtained from ticket agents at starting points, showing payment of regular full one-way first-class fare of not less than 75 cents on going journey.

7. If the necessary minimum of 100 certificates are presented to the Special Agent, and your certificate is duly validated, you will be entitled up to and including April 22d to a continuous passage ticket by the same route over which you made the going journey, at three-fifths of the regular one-way first-class fare to the point at which your certificate was issued.

AMENDMENT TO THE CONSTITUTION AND
BY-LAWS.

The following proposed amendment to the Constitution and By-Laws as submitted at the Annual Meeting held in Albany, April 17th, 1911, is published in accordance with Article IX of the Constitution.

To amend Chapter VIII, Section 1, of the

* Except that from stations from which it is possible to reach place of meeting by noon of April 18, tickets may also be sold for morning trains of that date.

By-Laws, taking Steuben County from the Seventh District Branch and placing it in the Sixth District Branch.

ANNOUNCEMENT.

The President has appointed Dr. Egbert Le Fevre, of New York City, delegate from the State Society to the Council on Medical Education of the American Medical Association.

The Public Health, Hospital and Budget Committee of the New York Academy of Medicine, at its last meeting unanimously adopted the following resolution, subject to the approval of the Council of the Academy of Medicine:

Resolved, That it is the sense of the Committee that any regulations adopted by the State Education Department under the Nurse Practice Act, should not be so formulated, interpreted, or applied as to prevent the training in properly equipped hospitals of a sufficient number of pupil nurses to meet the public demand for trained nursing service."

At a meeting of the Executive Committee of the Hospital Conference of the City of New York, held at the Hospital for Ruptured and Crippled, Friday evening, January 12th, the following important resolution was adopted:

Resolved, That the President be authorized to appoint a Committee of five (5) who shall act with the President to secure

(a) either such modification of the Nurse Practice Act or of the regulations adopted by the Education Department under the said Act, or

(b) such interpretation of the Education Department of the existing regulations as shall render it possible for the Hospitals of the City to continue the training of nurses in sufficient numbers to meet the public demand for trained nursing service.

The President appointed the following named Committee: Dr. C. Irving Fisher, Dr. Thomas Howell, Dr. S. S. Goldwater, Rev. A. S. Kavanagh, Dr. F. A. Brush, Rev. Geo. F. Clover.

At a meeting of the Public Health Committee of the Public Service League, held at the rooms of the Kings County Medical Association, 1313 Bedford Avenue, Brooklyn, the following resolution was unanimously passed:

Resolved, That a protest be made by the League to the Board of Health, against the employment of nurses in the treatment and diagnosis of any disease of the children in the schools or the exclusion of any child from the school based upon such diagnosis; we further

Resolve, That a protest be made against the proposed establishment of dispensaries in different parts of the City for the treatment of the general medical defects of school children, and we further

Suggest, That the rules of the State Board of Charities relating to dispensaries be rigidly enforced in the dispensaries already established by the Board of Health.

(Signed) PUBLIC HEALTH COMMITTEE, Dr. W. Schirmer, Chairman; Dr. Elias Bartley, Dr. Joshua M. Van Cott, Dr. A. T. Bristow, Dr. J. Richard Kevin, Dr. J. C. Kennedy, Dr. L. J. Morton, Dr. E. Rodney Fiske, Dr. O. S. Ritch, Dr. J. Rankin, Dr. W. Heeve, Dr. O. Rohde, Dr. Jas. Slavitt, Dr. Jno. Shields, Dr. Jno. Reb, Dr. John Walsh, Dr. Leon Louria, Dr. J. W. Fleming, Dr. V. Pascual, Dr. J. H. Droge.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF MONROE.

ANNUAL MEETING AT ROCHESTER, DECEMBER 19, 1911.

BUSINESS SESSION.

President, Seelye W. Little, Rochester; Vice-President, Charles R. Witherspoon, Rochester; Secretary, Albert C. Snell, Rochester; Treasurer, Frederick W. Seymour, Rochester; Censors, W. B. Jones, R. M. Moore, E. H. Howard, and T. Jameson, all of Rochester; Delegates to State Society, W. M. Brown, Rochester, and R. R. Fitch, Rochester; Alternates, L. W. Howk, Rochester, and W. E. Bowen, Rochester; Milk Commission, S. W. Little, Rochester, and J. R. Culkan, Rochester.

Two important resolutions were passed by the Society. One suggested by the Milk Commission in its report and the other proposed by the Comitia Minora. These were as follows:

Moved, That the Medical Society of the County of Monroe approves of the recommendation of its Milk Commission that steps be taken to secure the enactment of an ordinance requiring that all milk offered for public sale shall be labeled whether or not it is from tuberculin tested cattle; that milk from untested herds shall be labeled "Unsafe in raw state, for little children;" That the Milk Commission be empowered to represent this society in securing this legislation and to take such further action as may be necessary.

"Resolved; That the Board of Censors be instructed to nominate a list of experts in insanity for one year; that such of these who shall receive a 2-3 vote of the members present at the next regular meeting shall be certified to by the Medical Society of the County of Monroe, as qualified experts in insanity.

"It was further resolved, That the secretary send the list thus certified to, as qualified experts, to every judge and attorney practicing regularly in this county, with a brief note explaining that the Medical Society of the County of Monroe declines longer to submit its members to the odium of medical expert testimony as now presented and takes this method of vouching for certain experts and for no one else."

SCIENTIFIC SESSION.

President's Address.

"The Value of Scientific Diagnosis," W. B. Jones, M.D., Rochester.

MEDICAL SOCIETY OF THE COUNTY OF ERIE.

NINETYETH ANNUAL MEETING, AT BUFFALO, DECEMBER 18, 1911.

BUSINESS SESSION.

Treasurer, Dr. Albert T. Lytle, presented his annual report.

Preamble and resolution, in reference to appointment of a Surgeon General of the U. S. Public Health and Marine Hospital Service to succeed the late Dr. Walter Wyman, were presented by Dr. Lucien Howe and adopted.

The following resolutions were adopted:

"WHEREAS, There were in America during the last reported decade, 297,288 cases of small-pox with 6,632 deaths, and

"WHEREAS, The morbidity and the mortality of small-pox in America are rapidly increasing, and

"WHEREAS, Our country is the field of an active, aggressive and extensive propaganda of antivaccinationism, and

"WHEREAS, Education in the principles and importance of preventive measures is the only means of preserving our people from the dangers of the aforesaid propaganda and the consequent presence and increase of small-pox, therefore

"Resolved, That the Medical Society of the County of Erie hereby requests those in authority, City, State and Nation, to take suitable action to provide that, hereafter, in reporting cases of deaths from small-pox, mention and record shall be made of the facts and times and efficiency of vaccination and re-vaccination in every case.

"Resolved, That copies of this appeal be sent under seal of this Society to the Health Commissioner of Buffalo, the Health Commissioner of the State of New York, to the Medical Society of the State of New York and to the Public Health and Marine Hospital Service of the United States."

Dr. H. J. Mulford, Chairman of the Committee on Necrology, submitted a simple report on the deaths of members during the year.

Dr. H. R. Hopkins, Chairman of the Committee on Public Health, submitted a report, illustrated by stereopticon, in which he directed attention to inadequate ventilation of public schools, antivaccination agitation and the necessity for combatting and suppressing same, typhoid fever prevalence in Buffalo, Niagara Falls, Lockport and the Tonawandas, resulting from the pollution of water supply by sewage.

Dr. C. A. Wall, Chairman of the Committee on Membership, recommended the election of Dr. Roy C. Fisher, 42 Lawrence Place, and also of Dr. Joseph W. Young, 131 Allen Street, transferred from the New York County Society. Both were elected to membership.

President Dr. Daniel V. McClure presented his annual address which, upon motion, was directed to be printed in the *Buffalo Medical Journal*. Incorporated in this motion was the following "that it is the sense of this Society that no legislation pertaining to public health be considered by the State Legislature unless it emanates from the State Board of Health.

The following officers were elected for the ensuing year: President, Thomas H. McKee, Buffalo; 1st Vice President, J. F. Whitwell, Buffalo; 2nd Vice-President, John V. Woodruff, Buffalo; Secretary, Franklin C. Gram, 849 Humboldt Parkway, Buffalo; Treasurer, Albert T. Lytle, Buffalo; Censors, I. W. Potter, F. E. Fronczak, A. G. Bennett, L. Hendee, and John D. Bonnar, all of Buffalo; Chairman Committee on Legislation, F. Park Lewis, Buffalo; Chairman Committee on Public Health, H. R. Hopkins, Buffalo; Chairman Committee on Membership, C. A. Wall, Buffalo; Delegates to State Society, A. T. Lytle, J. Ullman, J. Richter, J. F. Whitwell, all of Buffalo.

Report of the Board of Censors was presented by Chairman Dr. George L. Brown who called attention to the various prosecutions for violations of the medical laws.

The Committee on Division of Fees was continued and requested to make a special report at the February meeting.

Retiring President McClure introduced President-elect McKee. Dr. McKee briefly thanked the members for the honor bestowed upon him.

MEDICAL SOCIETY OF THE COUNTY OF MONTGOMERY.

ANNUAL MEETING AT FONDA, DECEMBER 13, 1911.

BUSINESS SESSION.

The reports of the Officers of the Society and Committees were presented.

The following officers were elected for the ensuing year:

President—James W. White, Fonda.

Vice-President—Edward C. La Porte, Amsterdam.

Secretary—William R. Pierce, Amsterdam.

Treasurer—Charles F. Timmerman, Amsterdam.

Censors—D. Ayres, Fort Plain; C. Stover, Amsterdam; E. F. Bronk, Amsterdam.

Dr. E. F. Bronk read a most interesting paper as the President's address.

MEDICAL SOCIETY OF THE COUNTY OF
ALBANY.

REGULAR MEETING, AT ALBANY, JANUARY 9, 1912.

SCIENTIFIC SESSION.

SYMPOSIUM ON THE LIVER.

"Anatomy," H. E. Lomax, M.D., Albany.

"Pathology," W. D. Allen, M.D., Albany.

"Diagnosis and Symptoms," Jerome Meyers, M.D., Albany.

"Treatment," S. L. Dawes, M.D., Albany.

"Surgery," E. A. Vander Veer, M.D., Albany.

LEGISLATIVE NOTES.

STANDING COMMITTEES OF THE ASSEMBLY FOR
1912.

On the Judiciary—H. J. Hinman, Albany County; C. W. Phillips, Monroe County; J. L. Sullivan, Chautauqua County; A. F. Murray, New York County; H. Kopp, New York County; T. Shannon, Steuben County; R. L. Richardson, Allegany County; J. L. Crandell, Columbia County; C. J. Vert, Clinton County; A. J. Cook, Ulster County; A. J. Levy, New York County; J. Levy, New York County; J. L. Patrie, Greene County.

On Affairs of Cities—W. W. Colne, Kings County; H. E. Allen, Oneida County; T. K. Smith, Onondaga County; S. L. Adler, Monroe County; F. Brooks, New York County; W. S. Coffey, Westchester County; J. G. Malone, Albany County; C. C. Page, Erie County; H. J. Crawford, New York County; J. A. Bell, Queens County; J. A. Foley, New York County; J. J. McKeon, Kings County; J. C. Fitzgerald, New York County.

On Public Health—C. F. Brown, Cortland County; G. H. Whitney, Saratoga County; J. D. Stivers, Orange County; J. C. Winters, Jr., Livingston County; A. F. Lent, Kings County; H. A. Pierce, Wyoming County; A. Goodman, New York County; D. L. Edwards, Onondaga County; C. I. Fleck, New York County; R. P. Bush, Chemung County; T. A. Brennan, New York County; J. Schifferdecker, Kings County; H. Heyman, Kings County.

On Rules—E. A. Merritt, Jr., St. Lawrence County; F. L. Young, Westchester County; J. R. Yale, Putnam County; J. S. Parker, Washington County; A. F. Murray, New York County; A. E. Smith, New York County; D. D. Frisbie, Schoharie County.

On Ways and Means—G. H. Whitney, Saratoga County; F. L. Young, Westchester County; J. R. Yale, Putnam County; J. S. Parker, Washington County; B. R. Lansing, Rensselaer County; F. B. Thorn, Erie County; E. J. Cheney, Cattaraugus County; A. Macdonald, Franklin County; W. A. Shepardson, Chenango County; H. E. H. Brereton, Warren County; J. G. Jones, Jefferson County; A. E. Smith, New York County; D. D. Frisbie, Schoharie County; L. S. Chanler, Dutchess County; R. P. Bush, Chemung County.

On General Laws—F. B. Thorn, Erie County; J. T. Cross, Oneida County; A. W. Hoff, Kings County; M. Shlivek, New York County; S. G. Prime, Essex County; G. A. Slater, Westchester County; J. Wood, Nassau County; S. C. Crane, New York County; E. R. K. Karutz, Kings County; M. Goldberg, New York County; G. H. Wende, Erie County; E. Weil, New York County; M. Greenberg, New York County.

STANDING COMMITTEES OF THE SENATE FOR 1912.

On Judiciary—H. R. Bayne, S. J. Stilwell, J. D. McClelland, L. M. Black, Jr., A. J. Griffin, T. H. Ferris, W. P. Fiero, G. B. Burd, H. D. Hinman, J. M. Wainwright, H. P. Coates, R. F. Wagner, J. T. Newcomb.

On Cities—T. H. Cullen, J. J. Frawley, S. J. Ramsperger, D. J. Harte, S. J. Stilwell, R. H. Gittins, F. M. Loomis, J. F. Murtaugh, J. G. Saxe, E. M. Travis, J. B. Rose, V. M. Allen, J. D. McClelland, G. F. Argetsinger.

On Public Health—J. F. Murtaugh, C. D. Sullivan, A. J. Griffin, J. D. McClelland, J. F. Duhamel, F. W. Griffith, G. F. Argetsinger.

On Rules—R. F. Wagner, T. D. Sullivan, T. H. Cullen, S. J. Ramsperger, E. T. Brackett.

BILLS INTRODUCED INTO THE LEGISLATURE.

STATE OF NEW YORK.

No. 58. Int. 58.

IN ASSEMBLY.*

January 11, 1912.

Introduced by Mr. Brooks—read once and referred to the Committee on General Laws.

AN ACT

To prevent cruelty by conferring upon the board of regents of the University of the State of New York the power of supervision of experiments on living animals.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. No person shall perform upon a living animal an experiment of a nature to cause pain or other agony or distress to such animal except under the following conditions:

1. Such experiment shall be performed only under the authority of the faculty of a college or university incorporated under the laws of this State, or in a regularly equipped and bona fide hospital, or laboratory, and which such college, university, hospital or laboratory shall have been duly licensed by the board of regents of the University of the State of New York to perform such experiments as hereinafter provided, or under the authority of state commission of health, or a board of health of a municipality in this State.

2. Such experiment shall be performed only by a regularly licensed physician, duly licensed by said board of regents to perform such experiments.

3. The building, and if not wholly occupied by such college, university, hospital or laboratory, the particular part of a building, in which it is proposed to conduct such experiment shall be registered with the said board of regents, which board shall issue annually upon application, to the college, university, hospital or laboratory applying therefor, and which in the judgment of said board is entitled thereto, a license describing such

* The same as Senate Bill Int. No. 267, Printed No. 277, introduced by Mr. Burd and referred to the Committee on Public Education.

building or part of a building and authorizing animal experimentation therein.

4. The substance known as urari or curare shall not be used in any experiment performed upon any living animal.

5. Such experiment shall be performed only with a view to the advancement of physiological knowledge, or knowledge, which will be useful for saving or prolonging life or alleviating suffering, and no experiment shall be made for the purpose of demonstrating facts heretofore established and proved.

Section 2. The said board of regents may, upon the application of any physician duly licensed to practice his profession within this State issue to such physician a license to perform experiments upon living animals during the calendar year ending on the thirty-first day of December next after such application is made, and which such experiments shall be made by such physician only in a building or part of a building duly licensed as provided in this act.

Section 3. On the first day of June, nineteen hundred and twelve, and annually thereafter, the said board of regents shall designate and appoint such number of persons to represent said board as shall, in the judgment and discretion of said board, be necessary for the proper supervision of animal experimentation within this State. Any corporation formed under the laws of this State one of the objects of which is to prevent cruelty in animal experimentation, may certify to the board of regents a list of names of persons whom such corporation deems suitable for appointment as such representatives, and the board of regents shall make all designations hereunder from the lists of names so certified by such corporations. No person so designated and appointed by said board as a representative thereof shall receive any compensation from the state for his or her service. The said board of regents shall furnish to each person so designated and appointed to represent said board, a certificate under the seal of said board, and which said certificate shall contain the name and address of the person so appointed, the statement that such person is a representative of said board for the purpose of supervising experiments upon living animals performed within the State of New York, the date of such appointment and duration thereof.

Section 4. Every place where such experiments are conducted, as authorized in this act, shall at all times be open to and subject to entry and inspection by any representative of said board of regents designated and appointed as provided in section three of this act.

Section 5. Every person performing experiments under this act shall make a report in writing on the first day of January and July in each year, stating the anæsthetics used, if any, the number and species of animals used, and the methods, nature and result of each experiment in detail, and file such report in the office of the said board of regents. All such reports shall be published in the annual report of the commissioner of education, except that, in the discretion of the said commissioner of education, the publication of any paper of a series of experiments not then completed may be postponed until his next report.

Section 6. Any person who shall perform or assist in performing upon any living animal, an experiment of a nature to give pain or any other agony or distress, except as permitted by this act; or who excludes, or assists, either directly or indirectly, in excluding any representative of the said board of regents from a place which he is empowered by this act to enter, or who prevents or attempts to prevent such representative from exercising the powers of inspection conferred on him by this act, or who, being in such place, refuses to disclose his true name and residence to any such representative, or who violates any of the provisions of this act, is guilty of a misdemeanor, and shall be punished by imprisonment for not less than sixty days nor more than one year, or by a fine of not less than one hundred dollars nor more than five hundred dollars, or by both such fine and imprisonment.

Section 7. This act shall take effect on the first day of June, nineteen hundred and twelve.

STATE OF NEW YORK.

No. 212. Int. 211.

IN ASSEMBLY,

January 22, 1912.

Introduced by Mr. Barnes—read once and referred to the Committee on Ways and Means.

AN ACT.

To create a commission to investigate the present condition and extent of the practice of vivisection in this state and to report what changes, if any, in the existing laws are desirable to protect animals from unnecessary suffering in this practice without unreasonably interfering with legitimate scientific research, and making an appropriation therefor.

The People of the State of New York, represented in Senate and Assembly do enact as follows:

Section 1. The Governor is hereby empowered to appoint a commission which shall consist of seven members, three of whom shall be men residing in this state and known to be in favor of unrestricted vivisection, three of whom shall be men residing in this state and known to be opposed to unrestricted vivisection; and the remaining member one (1) of which commission shall be a man residing in this state and known to be impartial and without prejudice on the subject and who shall be chairman of the commission. Such commission shall investigate and report the present condition and extent of the practice of vivisection or experimentation on living animals in this state and the amount of cruelty involved therein. It shall also make a full inquiry and investigation into the present condition of the law of this state for the protection of scientific investigation of this character as well as the condition and effectiveness thereof for the prevention of abuse in vivisection and of unnecessary cruelty to animals and what further legislation, if any, is needed to prevent unnecessary suffering of animals through such practice or its abuse without interfering with properly conducted and legitimate scientific experiments by competent experts. For these purposes the said commission is hereby authorized as far as possible to inspect the practice as it exists, to send for persons or papers, to administer oaths and to examine witnesses and papers respecting all matters pertaining to this subject. This commission shall serve without compensation but may expend from the moneys appropriated by this act, such sums as may be necessary for clerical or other assistance and other actual expenses. This commission shall make a full and final report to the governor within one year after its appointment, including such recommendations for legislation as in its judgment may seem proper.

Section 2. For this purpose the sum of five thousand dollars (\$5,000) or so much thereof as may be necessary, is hereby appropriated.

Section 3. This act shall take effect immediately.

January 3 to 30, 1912.

IN ASSEMBLY.

Regulating experimentation upon living animals. It prohibits such experimentation except at a college, university, hospital or laboratory licensed by the state regents to perform such experiments, or under authority of the state or local health authorities. By Mr. Brooks. To Committee on General Laws. Printed No. 58. Int. No. 58.

Amending subdivision 5, section 166 of the Public Health Law relative to admission to the state medical examination, by providing that after the act takes effect medical schools shall not matriculate conditionally students who are deficient in any part of the preliminary educational requirements specified in the section. By Mr. Bush. To Public Health Committee. Printed No. 97. Int. No. 97.

Providing for the construction and maintenance of a sanitary trunk sewer and sewage disposal plant in the village of Port Chester, at not exceeding \$150,000, plans therefor to be approved by the State Board of Health. Bonds at not exceeding 5 per cent. and payable not more than fifty years may be issued therefor. By Mr.

Slater. To Villages Committee. (Same as S. 98). Printed No. 133. Int. No. 133.

Adding a new article 24 to the State Charities Law providing for the establishment of a state hospital for the treatment of intermediate and advanced pulmonary tuberculosis, to be under the control of five trustees, two of whom shall be physicians, and appropriating \$150,000 therefor. By Mr. McGrath. To Ways and Means Committee. Printed No. 145. Int. No. 144.

Amending section 52 of the Agricultural Law by providing that a person who sells or exchanges milk actually produced by a cow or dairy which is a fair sample of the milk produced daily by such cow or dairy and which has not been adulterated, shall not be guilty of any crime on account of the lack of proper proportion of food elements in the milk. By Mr. Wheeler. To Agricultural Committee. Printed No. 154. Int. No. 154.

Amending section 21 of the Public Health Law by providing that every local board of health may maintain an action for, or to restrain, any nuisance, whether direct or consequential. By Mr. Whitney. To Public Health Committee. (Same as S. 83). Printed No. 162. Int. No. 162.

Amending section 19 and adding a new section 118 to the Ogdensburg Incorporation Act, authorizing the board of health to adopt a sanitary code to be approved by a majority vote of the common council. By Mr. Seaker. To Cities Committee. Printed No. 187. Int. No. 186.

To create a commission to investigate the present condition and extent of the practice of vivisection in this State and to report what changes, if any, in the existing laws are desirable to protect animals from unnecessary suffering in this practice without unreasonable interfering with legitimate scientific research, and making an appropriation therefor. By Mr. Barnes. To Committee on Ways and Means. Printed No. 212. Int. No. 211.

To amend the insanity law, relative to wages of certain employees of state hospitals. By Mr. Phillips. To Committee on Ways and Means. Printed Nos. 209, 355. Int. No. 208.

To amend the education law, in relation to the establishment of a state school of sanitary science and public health at Cornell University, and making an appropriation therefor. By Mr. Bush. To Committee on Ways and Means. Printed No. 226. Int. No. 226.

Granting the right to John V. Stumpf to practice as a pharmacist as if licensed by the state board of pharmacy. By Mr. Machold. To Committee on Public Health. Printed No. 264. Int. No. 264.

To amend the public health law, in relation to regulating the furnishing of towels in public lavatories. By Mr. Shlivek. To Committee on Public Health. Printed No. 283. Int. No. 283.

To amend the insanity law, in relation to inspection of lists of inmates of asylums and hospitals for the insane and visiting such inmates. By Mr. Shlivek. To Committee on Judiciary. Printed No. 322. Int. No. 320.

To amend the judiciary law, in relation to coroner's jurors in the county of New York. By Mr. Shlivek. To Committee on Judiciary. Printed No. 323. Int. No. 321.

To amend the insanity law, generally. By Mr. Brooks. To Committee on Judiciary. Printed No. 337. Int. No. 335.

To provide for free hospital boats or barges for the city of New York. By Mr. Farrell. To Committee on Affairs of Cities. Printed No. 349. Int. No. 343.

IN SENATE.

Amending Section 21 of the Public Health Law by providing that every local board of health may maintain an action for, or to restrain, any nuisance, whether direct or consequential. By Mr. Brackett. To Public Health Committee. (Same as A. 162). Printed No. 83. Int. No. 83.

Providing for the construction and maintenance of a sanitary trunk sewer and sewage disposal plant in the village of Port Chester, at not exceeding \$150,000, plans therefor to be approved by the State Board of Health. Bonds at not exceeding 5 per cent. and payable not more than fifty years may be issued therefor. By Mr. Wainwright. To Villages Committee. (Same as A. 133). Printed No. 98. Int. No. 98.

Amending section 141 of the General City Law by exempting from taxation tuberculosis hospitals established and maintained by first-class cities outside of corporate limits. By Mr. Ramsperger. To Cities Committee. Printed No. 108. Int. No. 108.

Amending section 219 of the Public Health Law by providing that any applicant for a license to practice veterinary medicine whose registration is not legal, or who is not registered because of some error, shall submit to the state veterinary examiners or the state regents, proof that he was entitled to be legally registered. If he receives a certificate, his registration shall be deemed to have been valid from the date on which he should have registered. By Mr. McClelland. To Public Health Committee. Printed No. 111. Int. No. 111.

Establishing a New York State Board for the Blind, to consist of five persons appointed by the Governor. The board is to act as a bureau of information and to establish one or more schools for industrial training and workshops for the employment of the blind. It must prepare a complete register of the blind in the state. The bill authorizes the expenditure by the state of \$40,000 for the purposes of the board. By Mr. Burd. To Finance Committee. Printed No. 123. Int. No. 122.

To prevent cruelty by conferring upon the Board of Regents of the University of the State of New York the power of supervision of experiments on living animals. By Mr. Hurd. To Committee on Public Education. Printed No. 277. Int. No. 267.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

RETINOSCOPY (or shadow test) in the Determination of Refraction at one meter distance, with the plane mirror. By James Thorington, A.M., M.D. Author of "Refraction and How to Refract;" "The Ophthalmoscope and How to Use It;" Professor of Diseases of the Eye in The Philadelphia Polyclinic and College for Graduates in Medicine; Ophthalmic Surgeon to The Presbyterian Hospital; Ophthalmologist to The Elwyn and Vineland Training Schools for Feeble-minded children. Sixth Edition, revised and enlarged. Sixty-one illustrations, ten of which are colored. Philadelphia. P. Blakiston's Son & Co., 1012 Walnut Street. 1911. Price \$1.00.

DEATHS.

J. D. BROWNELL, M.D., Walden, died December 2, 1911.

LEO BURGHEIM, M.D., New York City, died January 28, 1912.

JOHN F. DAVIS, M.D., Brooklyn, died December 31, 1911.

TRAUGOTT F. M. ROEDIGER, M.D., New York City, died January 11, 1912.

J. W. THORP, M.D., Oxford, died December 15, 1911.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

ALGERNON THOMAS BRISTOW, M.D., Editor

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Vol. XII.

MARCH, 1912

No. 3

EDITORIAL DEPARTMENT

THE QUESTION OF THE DAY.

THE most important question which concerns the medical profession today is not that which deals with standards in the schools. Our curricula are fairly satisfactory, but no school, however severe its requirements can ever turn out a finished product. A medical school is like a nursery. It turns out saplings of four years growth, not giants of the forest to furnish shade or timber. The real growth must come after transplantation.

It is, however, of little use for a tree to grow at the top and branch out in luxuriant foliage if its roots are rotting and losing their hold on the solid earth. That is the position of the medical profession today. The Council on Medical Education is continually endeavoring to raise the educational standards, the profession is ever striving and pressing forward toward the extinction of disease by the arts of preventive medicine. The scope of our charities is constantly being increased, of which the largest part of the burden is borne by the medical profession. "Issachar is an ass bending between two burdens." The quotation has an uncanny aptness. How are we to meet the conditions which are driving us to the wall?

The editor is quite conscious that he has said these things before, but he is going to keep on saying them until the profession listens and takes heed. We are threatened today by the Department of Education of the State. Seriously threatened. A double standard of education would be an odious and unfair thing. It was bad enough when the legislature recognized osteopathy as a school of medicine, a school which recognized but one alleged fact in pathology—the displacement of a vertebra—one remedy, its manual replacement. It was bad enough when the Vice-Chancellor of the Board of Regents who

should be the guardian of higher education was not true to the high ideals of his office. It is still worse when he joins the ranks of the anti-divisionists. The *Brooklyn Eagle* is today the only newspaper which champions their cause and the Vice-Chancellor of the Board of Regents is its editor. It is well that the doctors of the State know who are their friends and against whom they must contend in battle array. We never expected to find in the State Board of Education an active enemy or in the State Board of Regents in the person of the Vice-Chancellor, an active partisan of an offensive and retrograde movement which, if successful, would put back the cause of research and tie the hands of investigation and which is today trying to cast unwarranted suspicion on an honorable profession.

We invite the assistance of the medical profession in solving these problems which relate to the business side of medicine. They are pressing. They involve, if not our very existence, certainly our prosperity and well being. We have fallen on evil times and into evil ways and there are traitors among those who ought to help rather than harm us.

With regard to the vexed question of fee-splitting the writer has ventured elsewhere in the *JOURNAL* to suggest a possible remedy. It is not an *ex cathedra* pronouncement. It is purely tentative. The objections should be stated. There should be the fullest discussion. The evil is widespread. In the words of a great statesman, "It is a condition and not a theory which confronts us." What we do to remedy it must be practical, easily applied and satisfactory to the three parties to the controversy, the specialist, the family practitioner and the public. If the remedy suggested in the article referred to is not equitable nor practicable, it is no remedy. We desire criticism, but criticism which is constructive, not destructive.

THE ALBANY MEETING.

THE 106th annual meeting of the Medical Society of the State of New York will take place in Albany, April 16th, 17th and 18th.

The president, Dr. Wendell C. Phillips, with the unanimous concurrence of the council in arranging his program, has made an important departure from the custom of former years and divided the meeting into sections as follows: A section on medicine, a section on surgery, a section on mental and nervous diseases, eugenics and medical expert testimony, a section of public health and preventive medicine and a section on the diseases of the eye, ear, nose and throat.

The program which Dr. Phillips, in collaboration with his section officers has arranged, is an extraordinary example of energy, industry and tact. Some of the most distinguished men in the country have accepted the invitation to take part in this epoch-making meeting. The annual oration on medicine is to be delivered by Dr. Harvey W. Wiley, of Washington, a man who may justly be called the champion of the people. Dr. de Schweinitz, of Philadelphia, will deliver an address on the Prevention of Blindness and the Instruction of the Blind Child. Dr. Makuen, of the same city, will talk on the Prevention of Deafness and the Instruction of the Deaf Child. Dr. Finney, of Baltimore, will deliver the annual oration on surgery, which is on a subject which ought to interest every general practitioner in the State—"The Duty of the Family Physician in the Management of Surgical Cases."

The public oration, to be delivered in the assembly chamber Wednesday evening, will be given by Dr. Walter B. Cannon, Professor of Physiology, Harvard University, on "The Benefits of Vivisection to Mankind."

Readers of papers from other states are as follows: Stengel and Deavor, of Philadelphia; Rosenow, of Chicago; Geo. Dock, of St. Louis; Surgeon-General Torney (Surgery of the Battlefield); Surgeon-General Stokes (Navy); E. G. Beck, Chicago; Truman W. Brophy, Chicago; W. C. MacCarty, Rochester, Minn.; R. W. Heberd, State Board of Charities; Lieut. S. M. Shook, U. S. A., also Capt. J. M. Phalan, U. S. A., Maj. F. F. Russell (Typhoid Prophylaxis) Theodore Horton, C.E., Chief Sanitary Engineer (The Epidemiology of Typhoid Fever and its relation to the Practitioner). The total number of papers in the entire program amounts to over 160 and comprises articles written by the best men in the State of New York. We ask the members of the state society to reflect for a moment on the enormous amount of work which such a program entails. Few men realize the mass of correspondence necessitated by such a program. No one can really appreciate the labor required who has never actually taken part in the arrangements for an annual meeting. The papers which have been collected by Dr. Phillips and his committee for the coming an-

nual meeting represent a mass of material equal to four ordinary annual meetings. Never have we had a program so varied. There are papers of interest to the specialist and to the general practitioner, the public as well. The question which the president has a right to put to the members of the society is this: "Are you going to loyally support me in the extraordinary effort which I have made to make this meeting valuable and interesting by coming to the meeting?" We trust that every member of the state society for whom attendance is possible will be in Albany at some time during the meeting and *will register*.

The program for the annual meeting to be held in Albany, April 16-18, will be found in the present issue of the JOURNAL, on page 145, corrected to date. The final program will contain complete information regarding all phases of the annual meeting including directions from the Committee on Arrangements, a map showing the location of the various meeting places. On arriving in Albany to attend the meeting all should register at the Bureau of Information and Registration located in the lobby of the City Hall.

If this program does not bring out a thousand men then the members of the state society either do not know a good thing when they see it, or are unwilling to personally support the president in the really masterly piece of work which he has done for them. You cannot support your president by staying at home and reading about it afterward. You cannot support your president by writing letters of congratulation.

Your presence at the meeting is what he desires. It is what he deserves and is what he ought to get.

The removal of the annual meeting from mid-winter to the pleasant days of early spring has taken away the principal excuse of the absentees.

In mid-April we all of us need a brief respite from the exigencies of practice. Usually also there is a lull in the work.

There is every reason why this meeting should break all the records for attendance.

We are confident that our members will be eager to show their appreciation of what has been done to make this an extraordinary meeting and that the president will be gratified to know that his labors have not been in vain.

WE MAKE HOUSEHOLD PETS OF THEM IN AMERICA.

Geneva, March 6.—"Doctor" Joseph Unterberger, a Christian Scientist, advertising himself as a "natural healer of all diseases," has been tried at the court of Canton of Appenzell for causing the death of a woman "by lack of medical knowledge and neglect" and sentenced to a year's hard labor and costs. He is expelled from the canton and is prohibited from exercising his "profession" in Switzerland—*Telegraphic News, N. Y. Times, March 7, 1912.*

Original Articles

THE PUBLIC AND THE MEDICAL PROFESSION.*

BEING A CONSIDERATION OF THE ECONOMIC DIFFICULTIES WHICH CONFRONT US.

By A. T. BRISTOW, M.D.,
BROOKLYN, NEW YORK.

MEDICINE as a profession has never been on a business basis. Not so long ago, not later than the last century, the practitioner scorned to charge a fee but accepted an honorarium. Many a doctor still practicing medicine once considered it the height of bad form to send a bill oftener than once a year. Even today many doctors render their accounts semi-annually. We have been slow to change our old fashioned methods and although the business methods of the whole world have been revolutionized we still cling to our medieval ways. Consequently we are actually being trampled under foot while modern business with its intensive methods and gigantic combinations has swept by us and left us floundering and bruised in the dust, the victims of our own traditions.

More than a quarter of a century ago the Medical Society of the State of New York for the better protection of the public from quacks and medical pretenders, secured from the legislature a law requiring all graduates of medicine to pass a state examination as a prerequisite to a license to practice. To protect the thousands of doctors who at the time this law was passed were legally practicing medicine under the old statute, they were exempted from the state examination, and licenses to practice were issued to them on filing their diplomas at the County Clerk's office. What has been the attitude of the public as represented by the legislature, toward the medical profession which brought about this most necessary reform, not in their own interest but in the interest of the public? The men with one remedy for everything, from yellow fever to the itch, graduates of Kirksville and other unsavory institutions to exploit ignorance and incompetence, secured from the legislature, State recognition under the specious plea of regulation and under an exemption clause cunningly modeled after our own law, a license to practice for over three hundred persons who had no medical education whatever. There was no parallel between the years of practice clause in our act and that of the osteopaths for the reason that those who were exempted from examinations by our act had already complied with the law as it existed prior to the act of 1883 whereas the bath rubbers, masseurs, etc., exempted by the act legal-

izing osteopathy had never complied with any law; were in fact law breakers at the time the law was passed. The same thing lately happened with the optometrists and the medical profession has been compelled to stand by helplessly and submit to be hoist with its own petard. On the whole I fear that our medical practice act has worked great injury to the public and the medical profession. When we framed it for the protection of the public we never dreamed that it would be turned against us and that it would be the means of securing a most valuable asset for the quack, state recognition. By these two legislative acts relative to the osteopaths and optometrists, the public has discounted the value of our education and increased the number of our ignorant competitors, to its own harm and our own loss and confusion.

What is the remedy for this condition of affairs? The only remedy which I can see is the obliteration of the lines between the schools. If the medical profession of this country does not wish to be swamped by hordes of pretenders like the Eddyites, the naturo-paths, the vito-paths, its members must get together and wipe out the shadowy lines between them. Do not, my friend, call yourself a homeopath or an eclectic. When you do that you join the ranks of the one remedy men because of your distinctive title. Be satisfied to call yourself doctor, an ancient and honorable title and no one in this County Society or in the American Medical Association will grudge you the use of any remedy which seems good to you, or any system. When that time comes, as come it must, if the educated men of the profession are to prevail against the invading horde of quacks, then will our medical practice act which demands a real and not a sham education, be a blessing to the public, as to the profession. In the recent diatribes which have appeared in a local paper much ado has been made about the report of the Erie County Medical Society on the evil of fee splitting. I am not here to defend the practice. Concerning the specialist who thinks it becoming and honorable by secret practices to get the better of his colleagues I make no comment. I leave him to the tender mercies of the Brooklyn *Eagle* and the patron saint of the osteopaths and the anti-vivisectionists. At the same time I have never read in the pages of the Brooklyn *Eagle* the report of the Committee of Erie County on lodge and contract practice, concerning the extent to which these customs were enslaving the profession and almost driving its members into practices which we all deplore. There are dozens of such organizations calling themselves by various high sounding names who are exploiting the medical profession and attempting to buy a gold dollar for ten copper cents, and I am sorry to say succeeding in the attempt

* Read before the Medical Society of the County of Kings, at Brooklyn, February 20th, and the Medical Alliance, New York, February 29, 1912.

because of our unbusinesslike methods and our blind adherence to an outworn system. Of course such societies could not flourish for a day except with the assistance of the medical profession. It is because they are able to secure the services of physicians that they flourish to the degradation of medicine the debasement of their selfish tools and the injury of their silly dupes who expect to get competent medical attendance for ten cents a week. What is the remedy for this evil? It is simple and self-evident. If physicians would refuse to serve these various orders and contract companies they would soon have to go out of business, but the most necessary part of the remedy, would be the loyalty of physicians to one another and at present such a thing does not exist.

We are engaged in a fierce and destructive, a demoralizing competition. That is what I mean when I say that we are blindly adhering to an outworn system. It is possible that for the general public we may have to reorganize our business methods entirely. There would be nothing immoral so far as I can see in a physician agreeing to accept a quarterly or monthly payment as a sort of sick benefit insurance from individual families so long as the payments were adequate, but the business part of such an enterprise should be in our own hands and not in the hands of a lodge or company. It is one thing to hire out to a company at a ridiculously low price so that the contract physician ceases to be his own master; quite a different affair when the physician deals directly with families or groups of families. I do not say that even such a modification of the contract system would be conducive to the highest type of scientific medicine. I do not even venture to recommend it. It is, however, in my opinion worth discussing.

In dealing with the economic problems which confront us we cannot leave out of sight the economic problems of our patients. The MacMillan Co. have recently published a work by Scott Nearing, Ph.D., entitled "Wages in the United States." The author thereof has made an investigation of the annual income of adult males in the United States and he finds that 90 per cent. earn less than \$800 a year, 75 per cent. less than \$600, and fully 50 per cent. less than \$500, and 20 per cent. as low as \$200 annually. It is evident for the lower sums that every member of that family must be a wage earner, since \$900 per annum is Prof. Chapin's estimate of the sum necessary in New York for a man, wife and three children to maintain what he calls a normal standard of living. This estimate seems too low. How the professor manages to work out the problem I should like to know, with potatoes at \$1.50 a basket, eggs 50 cents a dozen and other provisions at correspondingly high

prices. It must, however, be quite evident to the thoughtful mind that contract practice and lodge practice have grown out of the necessities and poverty of the people. We can not solve the problem by banding ourselves together into an iron bound trades union and refusing to treat people except for a sum they cannot pay. To do that would simply drive them in shoals to the dispensaries and the prescribing druggist. That is what compels me to the suggestion that it may be necessary for the medical profession to readjust its business methods and adopt some system which is capable of meeting conditions as they are. There is no question but that as a profession we are in deep water. I fear we are likely to be worse off in the future. I desire to call your attention to the last paragraph of the regent's report lately published in the *Brooklyn Eagle*. It reads as follows:

"It seems to me that the State must eventually come to the point of exacting differing measures of education and experience from those who practice the healing art in different ways or by means of differing instrumentalities. For example, the training required of those who administer drugs is bound to be more extensive than that required of those who do not, and the training required of surgeons is bound to go further than that of those who do not resort to the use of instruments."

Thus Dr. Draper of the Board of Education.

This seems at first sight quite innocent, but what it actually means is this; that the Department of Education meditates a double standard of education for medical men. A more preposterous and thoroughly vicious proposition never emanated from an educational body. It is Bryanism applied to medical education. It would mean, as in the case of currency, that the lower standard would eventually drive the higher out of circulation. Our critic of the *Eagle* publishes this without a word of disapproval. I happen to know that the State Board of Education is meditating a law which will require all graduates of medicine to spend one year in a hospital as a prerequisite to a license to practice. *This is, however, not to be applied to the osteopaths.* If the Department carries out its intention such a law will meet with most strenuous opposition. Should it pass you will agree that I have good reason for saying that worse things are to happen to us.

Another question which requires mention in speaking of the relation of the public and the medical profession is the unjust burden of public charity which the public puts upon us as a profession. This includes the hospital and dispensary evil, where physicians are compelled to give their time entirely without compensation and the matter of the Board of Health in which compensation of the most meager kind is doled

out to the medical employees of the City. Compare for a moment the salaries paid to lawyers by the city with those paid to doctors occupying positions of equal responsibility. In Manhattan an assistant district attorney receives \$7,500 a year. The Assistant Sanitary Superintendent of the Borough of Brooklyn receives but \$3,500. The Medical Inspectors of the Board of Health receive but \$1,200 a year, from which must be deducted about \$120 for expenses, for which sum they have to give practically their entire time to the city. It is the city wage of a day laborer. Moreover, recently under the pretext that the Board of Estimate would not grant the necessary means, 35 inspectors at \$100 per month were dismissed, but over 138 nurses at \$75 per month were employed in their place to act as diagnosticians of contagious diseases in the public schools in direct and flagrant violation of the medical practice act. In support of this statement I will read the following letter addressed to the Public Service League:

COPY.

Ernst J. Lederle, Ph.D.
Commissioner.

CITY OF NEW YORK
DEPARTMENT OF HEALTH

Office of the Commissioner of Health.

Medical inspection of schools.

December 26, 1911.

Mr. Thomas E. Clark, Public Service League,
195 Montague Street, Brooklyn, N. Y.

DEAR SIR:

In reply to your letter of December 16th, I am directed by the Commissioner to advise you as follows with respect to your several inquiries:

1. An application has been made to the Board of Estimate and Apportionment for a larger appropriation for the work of medical inspection in public schools so that this work could be extended to parochial schools as well as to other free schools in the City. This appropriation was not granted but the inspection of parochial schools will be continued to the limited extent to which it has been carried in the past.

2. Nurses have been assigned for a year past in the diagnosis of contagious diseases in the public schools and have been permitted in many instances to make exclusions for such contagious diseases. When exclusions are made the homes of the children excluded are visited by a representative of the Division of Contagious Diseases of the Department of Health, for the purpose of verifying the diagnosis, or otherwise. This method has been found to be more satisfactory than the method of exclusion as performed by the medical inspectors of the Division of Child Hygiene.

3. Funds have been provided by the Board of Estimate and Apportionment for the purpose of establishing clinics in the various parts of the city for the treatment of general medical defects and for the treatment of dental defects. It is the purpose of the department to establish these clinics as soon as may be possible after the first of January.

Very truly yours,

(Signed) CURTIS E. LAKEMAN,

Secretary to the Commissioner.

L. C.

You are doubtless indignant that physicians should be discharged by the Board of Health and nurses employed in their place, but what right have we to be indignant or to protest when some of the leaders of the profession in Manhattan and Philadelphia are substituting nurses as anæsthetists for physicians under the plea that they give a better anæsthetic. If that is the case the sooner we turn over the profession altogether to the women the better. The real reason is quite different. It is because a nurse will work for less money than a physician who is a trained anæsthetist. Thus we are confronted with the spectacle of men who are leaders in the profession and who ought to know better, doing what is in their power not to improve things but to make matters worse for their professional brethren, and what is far more serious, setting an example and creating a precedent which may prove more far reaching and disastrous than they imagine.

Not only are the medical employees of the city paid a scanty salary entirely out of proportion to their education and responsibilities but they are being displaced by nurses whom the city is employing to do work which rightly and legally belongs to physicians alone. The condition of affairs in the Department of Child Hygiene at present is as follows: (1) Nurses make all routine examination of children in class rooms for diagnosis. This is done once a month. (2) Nurses pass on all cases referred to them by school officials, except when the medical inspector happens to be present making physical examinations for adenoids, enlarged tonsils, etc., which happens two days every two weeks when the nurse may refer doubtful cases to the inspector. (3) Nurses also make visits to homes of absentees for the purpose of determining whether the absent children are ill of contagious disease or not. (4) Nurses are also employed to take cultures. (5) Nurses also make exclusions from schools, which of course involves making a diagnosis. The Board of Health will reply to these statements that subsequent to the report of the nurse a diagnostician is always sent for the purpose of confirming the diagnosis. This has

always been done and is still done where a medical inspector makes the diagnosis. The evil in the present system consists in the fact that a nurse is employed for the purpose of determining whether or not a child is suffering from a contagious disease. If her diagnosis is negative, it is not checked up and it is the overlooked cases which are fraught with danger, not those which are recognized. The city exercises the greatest care in checking up the reported cases. Thus where measles or chickenpox is reported, the diagnosis must be confirmed by the medical inspector of the contagious disease division. A diagnosis of scarlet fever must be confirmed by a diagnostician of the department. Smallpox and chickenpox in adults must be checked up by a diagnostician and usually the Chief of the division of contagious diseases. The original responsibility of the diagnosis in the Department of Child Hygiene still rests with the nurses who constitute the first line of defense. Recognizing the weakness of such a position the nurses in the Department of Hygiene were lately given a two months course of lectures on contagious disease and recently, I am informed, on complaints from public school principals that the diagnostic work was unsatisfactory, schools being exposed to overlooked contagions, the nurses were taken to the Willard Parker Hospital for contagious diseases in relays and shown the various cases with a view to educating them. The law of 1907 thus defines the practice of medicine:

"7. The practice of medicine is defined as follows: A person practises medicine within the meaning of this act, except as hereinafter stated, who holds himself out as being able to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity or physical condition, and who shall either offer or undertake, by any means or method, to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition."

The ability and offer to make a diagnosis is here clearly defined as the practice of medicine and the Board of Health cannot dodge behind the statement that a medical inspector is sent to confirm the diagnoses of the nurses, because that has always been the practice and this is a precaution which is not employed in cases examined by the nurses *but not reported*.

If the Board of Health is willing to break the law on the plea of economy, what shall we say of an economy which by the employment of nurses adds \$84,000 to the budget.

With regard to the parochial schools of the city attended by 125,000 children, medical inspection was for a time discontinued but after protest, the order was rescinded and nurses now visit these schools twice a week instead of physicians as formerly. In the Department of Contagious Diseases about half the work is now done by nurses, 9 doctors and 9 nurses doing the work which was, previous to 1909, done by 27

medical men. Nurses now establish quarantine, give directions as to care of case, placard the house, visit the case twice a week, take cultures, pass on the completion of the disease, raise quarantine and issue school permits, all in violation of the law. Nor do the nurses relish their new duties, for which they are paid no more than when they performed the duties strictly appertaining to a nurse. What has been the result of this policy of substitution? In 1910 the death rate from measles alone was greater in Brooklyn than in Manhattan with one-third less population, and in 1909, when there was no inspection for measles in Brooklyn, 509 children died of the disease as compared with 487 in all the other boroughs.

The Department of Health is threatening the welfare of the medical profession from another quarter when it proposes to establish free dispensaries for the treatment of school children for such diseases as adenoids, enlarged tonsils, defective teeth, diseases of hearing, etc., *unless* it applies to the patients of such dispensaries the rules of the State Department of Charities which are designed to exclude from the benefits of free treatment those who are able to pay. It is just such abuses of public charity which are rapidly bringing about intolerable conditions in the medical profession. When we consider the fact that preventive medicine has almost annihilated many diseases and that the constant effort of the profession is in the direction of further curtailing the inroads of disease, we recognize the aptness of an illustration by a recent writer who compared the doctor to a man who was sitting on a branch of a tree which he was busily engaged in sawing off close to the trunk.

Another matter which we ourselves some years ago abandoned wholly to the laity was the matter of the qualification of nurses. What has been the result? Because of the utterly absurd educational requirements which a lay board demands of the pupil nurse before she can enter a school as a probationer, we are today confronted with a shortage of nurses in all our large hospitals. So bad is the situation that at a recent committee meeting in New York, Dr. Goldwater, the Superintendent of Mt. Sinai, told the members of the Committee that the trustees of Mt. Sinai had formally notified the Department that in admitting nurses to its training school it would be obliged to disregard its requirements. Everyone here knows perfectly well the forcing process to which the pupil nurses have been subjected in training, so that as a result, on graduation, the training schools are presenting to the profession young women who had been half trained in many purely medical topics entirely out of their province and too little trained as nurses; often moreover broken in health by the severe strain to which they had been subjected by totally needless hard study on subjects which did not concern them. The proper and natural administrators of any nur-

sing system are physicians and not a lay board or a few ambitious nurses with a talent for intrigue and despotism.

It is well known to the reading public that the greatest military men of the age, the ablest tacticians, the most astute statesmen and the shrewdest politicians always have their offices in the editorial rooms of the metropolitan press. So also the clergy may take lessons from the same source. Thus one of the fraternity to which the world is indebted for the sum of all wisdom recently donned surplice and bands and proceeded to preach an eloquent sermon to the medical profession full of pious ejaculations and Biblical quotations on the sin of fee splitting. It is quite true that he never took the trouble to inquire into the conditions which have been noted in this paper, which have had a tendency to pauperize the profession. It is also equally true that he never inquired whether there was anything at all to be said on behalf of the general practitioner. In the editorial columns of the *New York State Journal of Medicine* the writer has more than once pointed out that the evil practices of which we are accused are the result of the intolerable economic conditions which surround us.

Minatory resolutions on the part of county societies and the respected New York Academy of Medicine have a purely academic value. They are expressions of virtuous sentiment which are creditable but they have been and will continue to be quite useless as remedies. To expel members of county societies for fee splitting, could be done only on legal evidence. How is the society going to get this evidence? Certainly not from either of the two parties to the transaction. A law which cannot be enforced is a bad law because it brings the law into contempt. Why is it not just to frankly inquire whether with all the difficulties which are confronting the general practitioner he is at present getting a square deal from the specialist and the public? Has he not a real and substantial grievance? Let us take one instance which will serve as a type of many. A struggling practitioner is called to see a case of abdominal pain. He makes two or three visits, decides that the case is one of appendicitis, calls a surgeon who confirms the diagnosis and advises operation. The patient is removed to the hospital, for the time being passes out of the sphere of influence of the family practitioner, ceases for that time to be a source of income to him which is in fact transferred to the surgeon. Let us estimate the income of this particular doctor at \$2,000 a year, which is twice the estimate of the average physician's income. The surgeon for his services receives an average fee of \$150, 7½ per cent. of the entire annual income of the physician who has surrendered the case. The least that can be said of such a situation is that it is full of temptation for the poor doctor and the ambitious

surgeon. Is there any remedy? I do not know, but with the greatest diffidence and the knowledge that I may be misjudged and misunderstood I offer the following: First, that the county society recognize the inequality of such transactions and the substantial injustice to the general practitioner who is not adequately paid for his responsibility in recommending operation in conjunction with the surgeon. Second, that the county society in consideration of all the facts set forth in this paper, say that it shall be allowable and proper for the physician and surgeon to render a joint bill to the patient in which the family practitioner shall be recognized as he never has heretofore except on the sly and by a secret agreement, in itself always a bad thing. What compensation shall go to the physician and what to the surgeon, I leave for discussion. It is not an easy matter to determine, but I offer the suggestion tentatively and mainly for the purpose of eliciting discussion. It seems to me to be practicable and in so far as the transaction is known to the patient, also honorable.

Of course, I see that it is quite possible for such a course to result in surgeons bidding against each other for the job, but that is what is actually done in secret today and it seems to me to be better and fairer for the profession to come out openly and acknowledge that an injustice has been done the family practitioner in the past and try to find an honorable method of remedying the injustice than to continue the present secret methods. For my part I have faith in the sense of justice of the family practitioner and I do not believe that if the course suggested were adopted that the doctors would try to drive the specialists to the wall. There are as fair-minded men in medicine as in any of the learned professions and in the long run right would prevail and the trickster and the man who was willing to practice unfairly and secretly to the detriment of his neighbor would find himself shortly in disrepute.

The suggestion which I have made has been the result of much thought and is an honest attempt to find a remedy for a real evil—the secret division of fees. It may not be the right way. It may not be the best way. I offer it in all sincerity and good faith. There is no single remedy for the social and economic conditions which are crowding us to the wall, but the recognition of these conditions is a prerequisite to the application of any remedy and the most encouraging sign of the times which has appeared is the fact that medical societies all over the state are recognizing the unfavorable conditions which surround us and which are largely responsible for the evil ways into which we have fallen. The president of the New York County Society lately devoted his inaugural address largely to the discussion of these questions. There is something more important today for the county society than discussing scientific

papers however meritorious. County, state and national societies have too long neglected the consideration of the economic conditions which confront us. Fortunately signs of life and intelligence are appearing and we are beginning to understand that we must change our methods if we are to remain as a profession even moderately prosperous.

Finally, it must be evident to all of you that nothing whatever can be accomplished without the development among us of personal loyalty in which at present we are absolutely deficient. What happened a year or two ago, when the superintendent of a local hospital promulgated rules which were arbitrary and most offensive to the visiting staff of the hospital? Nothing. The staff, with two exceptions, submitted. Why? Because they knew perfectly well that if they refused to submit and resigned, the hospital authorities would shortly have been obliged to call out the police to keep the applicants for their places in line and prevent them from storming the doors.

In the language of Æsop I say to each and all of you, *De Te Fabula*.

Discussion.

DR. EGBERT LEFEVRE: *Mr. President and Members of the Medical Society of the County of Kings:* I am very glad to be present here tonight and to have heard Dr. Bristow's paper on the economic questions that are confronting the medical profession.

I think that those of us who have been in the practice of medicine for the last twenty-five or thirty years, appreciate the fact that since our graduation many new medical and economic problems have arisen, which concern very closely the present practice of medicine. In the last three decades the whole system of medical education has been changed and the initiative came from the medical profession itself and not from the public. The standard of preliminary education for admission to the study of medicine has been definitely established. The length of the medical course has been extended from two years of six months each to four years of eight months each. The majority of medical graduates now voluntarily take post-graduate courses, serving as hospital internes for one or more years. At the present time, the educational capitalization of the medical practitioner is far beyond that of any other profession. The question thus arises very naturally "What has been the trend of this capitalization?" It has given to the public a much better educated body of men who are practicing medicine and who are giving much more efficient public service. But how is the public recognizing this? Has it given to the medical profession that place in its counsels that it deserves? Has it given to the practicing physician that voice in

the determination of the problems in sanitation and public health that he deserves? I think that there can be only one answer. The public does not at the present time listen to the counsel of the medical profession as it should, and it is to the detriment of the public. This increased educational capitalization has had its influence in the distribution of medical men. The majority of those who have graduated from the best medical schools and taken the hospital courses have felt that their capitalization was such that they could not locate in the country and practice medicine on economic principles any more than a man with a capital of one or two hundred thousand dollars would think of opening a business at a country crossroads. This has caused a congestion of medical practitioners in the large centers of population, while there has been rather a decrease in the rural districts. It is for this reason that the medical practitioners in the cities are confronted with the economic problems that have been presented tonight. The abuse of free medical service, as offered in dispensaries, hospitals and other charitable efforts, is one that has grown progressively in large cities. I think that we have got to face this problem largely from our own side. Those who practice in the small centers of population are acquainted with the circumstances of all the people and treat willingly, as part of their general practice, those who are unable to pay. They do not expect to receive any pay for their services to these people. They carry on their individual charity work purely as a matter of public duty. In large cities, such intimate acquaintance with the circumstances of the people who seek medical advice cannot be expected of the general practitioner and therefore there has grown up dispensaries to meet the needs of the very poor. If it stopped there, there would be no dispensary abuse, because I do not think that any man in the medical profession begrudges the medical service given to the poor, but the public have been educated to the fact that medical service can be obtained free, and therefore they have taken counsel of their prudence and sought what they consider efficient medical treatment in the dispensaries and hospitals. The managers of the dispensaries and hospitals have catered to this feeling and by charging a small amount, as ten cents for a prescription, have made those who are fully able to pay their physicians feel that they are meeting their financial obligations by paying this small amount. This is absolutely wrong and I do not think that the dispensary trustees or doctors who are practicing in the dispensaries are using their best efforts to weed out the unworthy. But who are the unworthy? That is a most difficult question. Frequently those who come to the dispensaries well dressed and seemingly in good circumstances are those who are really in the greatest need of free medical attendance. Their work in stores and offices de-

mand that they dress decently. The large increase in the cost of living without a corresponding increase in salary, has made the problem of living in the city very difficult, and whenever sickness occurs, it is a calamity. Many of those whose ailments demand protracted treatment are advised to go to the dispensary by their physicians, who feel that they are unable to give the special kind of treatment demanded and who know that the patients cannot pay for it elsewhere. Unfortunately, not only are these patients put in the way of free medical treatment, but they spread the information broadcast and those who are able to pay, go to the dispensaries also. It is not right to put upon the physicians practicing in the dispensaries the work of sorting out the unworthy. It puts them in a false position and many feel that they would rather treat nine unworthy cases than add to the hardships of one deserving applicant.

As a part of the great uplift movement that is worldwide, there has been a marked increase in public sanitation. This has extended beyond merely protecting the public against infectious and pestilential diseases, to controlling most of their activities. No one doubts the necessity or value of protecting the public from itself and especially the need of intelligent medical supervision over public school children so that there can be early correction of defects which would render them less efficient members of the community later in life, but many of the methods of the boards of health are open to criticism. They have no right to have medical work done by those who have not been educated for the purpose. The training of nurses does not qualify them for this work and therefore substituting them for trained physicians who have served faithfully on the board of health and therefore received an additional training in sanitation, is wrong. The paternalism of the boards of health and other charitable efforts, as well as the decrease of infectious diseases, has limited the work of the medical profession and made the struggle for existence a much harder one. To meet the changed economic conditions, numerous remedies have been offered and much advice has been given. One is that the medical men should conduct their work on the lines found profitable in business rather than that of a profession, as heretofore. The claim has been made that the present unsatisfactory status of the profession is due to the lack of business acumen. Undoubtedly the majority of medical men are poor business men and this is not altogether to their discredit, for it is due to their altruism and high ideals.

That some members of the profession have taken heed of this advice to model their practice according to the methods of general business, is proven by the statement that "fee-splitting" has become a practice. While undoubtedly the medical profession ought to use business methods, still they should not adopt those which have been

denounced by the public and the courts. "Fee-splitting" is no better than rebating by transportation companies. It is, in fact, more dishonorable, because it lacks even the excuse of business exigencies. It is deplorable that some of the members of the profession, in striving to use business methods, have adopted only the disreputable ones. The practice cannot be too strongly denounced and it should be penalized the same as rebating by the transportation companies has been and the one to be penalized should be the givers of the rebate. The consultant, whatever be his line of work, who tries to increase his practice by offering to split fees with the physician who sends him cases, is beneath contempt and it should be the duty of every honest member of the medical profession to make his feelings in this matter known.

Dr. Bristow has offered a tentative plan for meeting the present economic conditions. But is this the way to do it? The family physician who conscientiously directs a patient to a consultant, should not be open to the suspicion of any probable division of fees. The consultant should honestly meet the financial condition of the patient by making his fee such that the patient can pay not only the consultant his fee, but also feel under obligations to pay his family physician for his attendance. Under no circumstances should any secret agreement be entered into and the public should know definitely that the medical profession does not countenance the practice.

Medical societies have, by resolutions, condemned the practice. These resolutions voice the sentiment of the vast majority of the medical profession. It may be difficult to prove that members of this or any other county society have been guilty of "fee-splitting," so as to warrant their expulsion, but it is possible to stop the practice by ostracising those who are known to do it. Consultants should refuse cases from those who ask and practitioners should refuse to refer cases to those who offer bribes. The practice is contrary to the traditions and ideals of American medicine, and it must and will be stamped out.

I am very much surprised that the Department of Education should even suggest that there should be different standards for those who practice medicine in this state. It was a great gain when the law governing the practice of medicine made the medical sciences the basis of the examination for license to practice. This test was one that is applicable to all schools of medicine, as it ignores the different therapeutic beliefs and demands that all shall have sufficient training in the fundamental sciences to choose intelligently what means he should employ for the treatment of disease. A physician who intends to limit his treatment to a specialty or to use only one therapeutic method, needs the greatest amount of training, because only one well grounded in the medical sciences would appre-

ciate the limitations of such a specialization or restricted method of treatment. Therefore, I say it is educationally wrong and scientifically wrong for the Board of Education even to suggest that there can be a difference in the equipment of those who practice medicine. There cannot be two or more standards of medical education.

DR. WENDELL C. PHILLIPS: *Mr. Chairman and Gentlemen of the Medical Society of the County of Kings:* I must confess that if my desires were duly carried out, I should remain a listener tonight, because it has been my purpose to get all the information possible along the lines covered by the paper, in order that I might be thoroughly equipped at the coming meeting of the state society to present the facts in proper form, so that we may stand together regarding these matters of vital interest, and especially those in which the high standards of the medical profession are being attacked. There can be no question that "united we stand and divided we fall." We are in full accord with the majority of the statements that have been covered by Dr. Bristow tonight, but we must submit the query, "What are you going to do about it?" It is all well for us to meet in conclave and enter into spirited discussions regarding these abuses, but the more serious question to know is, how shall we handle these abuses, and how shall we overcome the evil. I wish we might discover a solution tonight, because some of them are of vital interest to us, and without entering into a minute discussion of many of these matters, it seems to me that we should meet them as two armies meet in battle, and when we see the evils that we know to exist, unitedly attack the enemy.

Dr. Bristow has not at all overdrawn the picture, nor has he sufficiently condemned the action of the education department in Albany in their unwise and retrograde suggestion that the standard of medical education should be lowered. Some of you may not be aware of either of the fact or of the seriousness of the proposition. In his report to the Board of Regents at the December, 1911, meeting, A. S. Draper, Commissioner of Education, called attention to the fact that "Dr. Ralph H. Williams, an osteopath, who is a member of the State Board of Medical Examiners * * * states that in the present undeveloped situation as to schools of osteopathy it would not be possible for graduates thereof to comply with the requirements." Later on in the same report, he states that "It seems to me that the state must eventually come to the point of exacting differing measures of education from those who practice the healing art in different ways or by means of different instrumentalities. * * * The training required of those who administer drugs is bound to be more extensive than that required of those who do not and the training required of surgeons is bound to go

further than that of those who do not resort to the use of instruments of incision." And this from the head of the education department of the Empire State. We must not forget that nearly twenty-five years ago the medical profession of this state conferred a boon in protecting the public health by procuring a medical law, which insisted upon proper preparation for those men who are to be entrusted with the medical and surgical care of our people. This law still exists and it has been most beneficent in its effects. We have a high standard of medical education, and it ranks well with that of other professions. A careful reading of the above mentioned report shows clearly an attempt to befog the real issue in the case by emphasizing the evil of "fee-splitting" in an apparent effort to belittle our great profession. It is our duty at the very beginning to combat this attempt, and it seems to me that the various county societies should pass resolutions demanding that the high standard of medical education should not be interfered with. From the county societies it should come to the state society, where I feel that I can pledge you the support of this great society, representing 7,000 physicians. You have never heard of the legal profession attempting to devise a grading of lawyers. Neither should there be a process of grading in the qualifications for the practitioners of the healing art.

Regarding the agitation of the "fee-splitting" evil by the Medical Society of the County of Erie, I feel that too great prominence has been given to this matter. It is an evil and one that in my judgment cannot be regulated by law, but must be settled by a sense of high moral example by the leaders of our profession. That the evil is general I do not believe, and it would seem to me that any of our societies would produce a splendid result by expelling any members who could be proven guilty. This is the method followed by the Bar Association in dealing with lawyers who do not live up to their standards. The more we elevate the standards of our medical profession, the less glaring will the evils become.

The nursing problem is serious. If I am correctly informed, the trained nurses themselves are at least partially responsible for the state law of registration, in which a standard has been set which seems to be out of all proportion for the requirements of a trained nurse. The training in the nurses' training schools should fit the woman for her vocation of nursing. The curriculum in most of the schools is so long and so severe that it results in turning out women who are half doctor and half nurse. It is unnecessary to make doctors out of nurses. We want competent nurses only and in my judgment two years is sufficient for this purpose. We should not make doctors out of nurses, but we should make nurses out of them.

The Health Department of the City of New

York should not be permitted to infringe upon the law. If they are employing nurses to do work for which only registered physicians are legally qualified to perform, it seems to me that the evil can be stopped by resorting to the enforcement of the law, and this should be done.

DR. JAMES W. FLEMING: *Mr. President and Members:* After reading, or listening to the author of the paper, I feel that about the last word has been said on that subject, for his premise is always correct, his arguments are conclusive, and his conclusions are just. But this broad subject, it seems to me, as has been discussed by the gentlemen from New York, is worthy of further discussion by our society. It is a question of vital interest to every man and woman who practices medicine. I know that of all the professions and of all the businesses, the medical profession is above all others. The medical profession has been doing work in the past twenty-five years at least for the people, such as no other party of men have ever done before. Someone must attend to the needful in these great cities, and the medical profession has been doing their share of the good work. Ten years ago, the death rate was from twenty to twenty-two to the thousand; now, the death rate, we read by recent bulletins from the health department, is from thirteen to fourteen to the thousand. That is not because physicians have cured diseases so much as they have prevented disease. They have taught the people through public education in various ways, through the system of school inspections; a measure that has diminished the death rate from twenty to twenty-two to thirteen to fourteen; for that we are suffering the effects, as intimated in the paper read by Dr. Bristow.

While the profession may not be loyal to one another, they certainly are loyal to the public, and I believe that the public owes this profession the same loyalty that we give to the public, and I feel certain that the attempts that are being made to belittle the profession in this city, in this state, in fact, all over, is uncalled for, unjust and unfair. The attempt to lower the standard, as suggested, of medical education or entrance to the field of medicine, is absolutely wrong and should merit our disapproval publicly and earnestly. The action of the health department in dismissing thirty-five men on the first of January, who were employed as inspectors, is unjust, uncalled for and illegal, and should merit the disapproval of not only this county society, but of our state society, by expressed resolutions. I want to say that I stand for honesty in medicine as in everything else, and I believe that every member of this society stands for that same honesty and that same high degree of honor which we all merit, not only as a profession, but as individuals.

INAUGURAL ADDRESS.*

By CHARLES GILMORE KERLEY, M.D.,

NEW YORK CITY.

IN assuming the presidency of the Medical Society of the County of New York, I wish to express my appreciation of the high honor which you have conferred upon me and to assure you that I am not unmindful of its duties and responsibilities.

Two years of service on the Board of Censors and three years on the Comitia has impressed upon me the fact that the officers of a society as large and important as this one, have to devote much time and work for the proper performance of their duties. I hope with your co-operation to fill the office as acceptably as my distinguished predecessor. I am confident that during the year of 1912 the efforts of the Censors, the Comitia and the various committees will meet with your endorsement.

The functions of your society are varied and much is required of us other than matters of a distinctly scientific nature. The society is looked upon as a protector of the public health; physicians look to it for redress of wrongs and the maintenance of ethical standards. The public look to us for redress against not only all our own members but all physicians.

The work of your legislative committee is to keep in touch with medical legislations, to inaugurate that which seems desirable, to promote that which is beneficial and obstruct that which is vicious. Signally effective work has been accomplished during the past year by the society's attorney and his staff. Charlatans, illegal practitioners of medicine, proprietors of so-called medical institutions and members of various cults illegally dealing with things medical, have been brought to the bar of justice. Without this activity on the part of your society, without this protecting influence for the public good, the city of New York would be overrun with those who prey upon the ignorant among all classes of society. This branch of our work alone stamps the society as a public benefactor of no little importance.

Signally effective educational work is being done by the Public Health Education Committee of the American Medical Association. A series of lectures are being given in many county medical societies throughout the United States, besides lectures to women's clubs, mothers and teachers' organizations, young women's christian associations, church and settlement clubs. Work is thus organized and going forward in forty-eight states and in Alaska, Panama and Hawaii. Since the organization of this work in July, 1909, over 5,000 lectures have been given to audiences aggregating 330,000 persons.

The Public Health Educational Committee of

* Read before the Medical Society of the County of New York, at New York City, January 22, 1912.

the county society of which Dr. Rosalie Slaughter Morton is chairman, has prepared its third lecture course, consisting of twelve meetings, in which thirty-six lectures are to be given for the benefit of the public.

The attendance at these meetings is large. At the first meeting recently held, this hall and the grill room were filled, many standing, with those anxious to learn. The public needs and appreciates this instruction. That education along similar lines is needed higher up is evidenced by the executive order of President Taft who states under Section III in relation to the practice of medicine in the canal zone, "That any person shall be regarded as practicing medicine within the meaning of this order who shall prescribe for, operate on, or in any wise attempt to heal, cure, or alleviate, or who shall in any wise treat any disease or any physical or mental ailment of another; provided, that nothing in this order shall be construed to prohibit the practice of the religious tenets of any church in the ministrations of the sick or suffering by mental or spiritual means, without the use of any drug or material remedy, whether gratuitously or for compensation, provided that sanitary laws, orders, rules and regulations as are now or hereafter may be in force in the canal zone are complied with."

This section shows a knowledge of scientific achievement and appreciation of medical endeavor that would be amusing were it not tragic.

Your society insists that the civic characters and professional deportment of its members be above reproach and the society has not hesitated to censure and dismiss its members for cause.

There is no provision in our by-laws for the disciplining of qualified members of the profession who are not members of the society. The omission allows many guilty of unprofessional conduct to continue their work unimpeded. A precedent has been established by the bar association which contains a by-law which permits that complaints involving professional misconduct may be referred to the committee on grievances, against any member of the bar whether a member of the association or not.

We have the opinion of Mr. Justice Miller who states in his opinion in the Ewald case that he is "far from suggesting that a court of equity should enjoin a county medical society from inquiring into unprofessional conduct either of members or non-members. In order for the society to best protect the public, it should take cognizance of any and all charges of sufficient gravity against physicians licensed to practice in the state, whether they are members of the society or not. If this offense is of sufficient gravity, justifying the revocation of a license, these facts could be laid before the Board of Medical Examiners."

In New York the license of a practitioner of medicine may be revoked for any of the following reasons:

1. Fraud or deceit in his practice or by which he was admitted to practice.
2. Guilt of a crime.
3. Habitual drunkenness or addiction to drugs.
4. Engagement or undertaking to procure or perform an abortion, selling or advertising for sale abortion, drugs, instruments, or appliances. This is the statute of 1806.

It will be observed that there is no provision for revocation on account of unprofessional conduct. Some states have provided for this in the statute relating to the revocation of a license. In the state of Utah, unprofessional conduct is defined to include criminal abortion, claiming to permanently cure manifestly incurable diseases, betraying of professional secrets, the making of grossly improbable statements in advertisements, the advertising of any medicine or means of re-establishing the monthly period in women. Any offense involving moral turpitude, habitual intemperance, the excessive use of drugs or gross immorality. It would seem most desirable that "unprofessional conduct" should be incorporated and defined in the New York statute.

Unprofessional conduct might be defined something as follows:

1. The claim by any practitioner of medicine, orally or by advertisement, of ability to cure any incurable disease.
2. The disclosure of information of, or concerning patients obtained or acquired by reason of the existence of professional relation of physician and patient.
3. Advertising the cure and treatment of venereal diseases.
4. The making of grossly improbable statements in advertisements.
5. The advertisement of the sale of any medicine or means purporting to be for the re-establishment or regulation of the menses.
6. Any other conduct not specifically set out herein-above unfavorably affecting the character, interests or dignity of the medical profession or any members thereof.

In this connection the most difficult and disagreeable subject of medical charities rises before us, particularly the abuse of medical charity.

The state rightly insists that medical men must be well qualified. The medical course in our schools has been doubled during the past twenty years. Much is required of the student before he may receive his degree and take the state board examination. In our medical societies we establish high standards of honor and professional conduct.

When so much is required it would seem but fair that effort be made in order that those who meet these requirements be given an opportunity for a reasonable return. In other words, we ought to take better care of our young medical men.

The medical profession does more work with-

out compensation than all the other professions combined. For this we get scant credit and why? Because we, physicians, have educated a considerable portion of the public to feel that medical services are due them without price. We have cheapened our profession in the eyes of the public and we are cheapening it every day and one way is the bidding for work through medical charities. Hundreds of physicians today in New York City are barely earning a poor living. Not because they are not qualified, not because they are not willing to work, not because there are no sick to be treated, not because of the existence of various cults and societies which deal with things medical, not that there are too many physicians. These qualified physicians, many of them members of this society, are deprived of a reasonable living because medical charities as represented by hospitals, dispensaries and other societies, lodge physicians and contract practice, treat those able to pay with little or no compensation.

A distinguished member of our profession recently stated before the New York Academy of Medicine that the community did not appreciate medical endeavor. We do not doubt this gentleman's statement and it is explained partially on the grounds that humanity is so constituted that it appreciates most what costs most and what it most strives for. With hospital and dispensary and other societies striving for patients, we must not expect the community to put a high value on what we are so anxious to give away.

Sixty per cent. is a low estimate of those who could pay for medical services, who are now getting it free. In twenty per cent. of this number it would be difficult to determine whether or no they were deserving of free treatment. The remaining forty per cent. are composed of people who are not poor and many among them enjoy larger incomes than the physician who is treating them. There was a time when some hesitancy was manifested before going to a dispensary. Such timidity has passed away.

Attempts have been made from time to time to correct this evil by legislative means and supervision without success. The remedy is in the hands of the medical profession. The physician knows when a deserving patient is being treated and he knows when he is treating one who is not deserving and as long as medical men will supply free treatment to those who do not deserve it, just so long will other medical men be deprived of what would be theirs.

The most important feature of the dispensary abuse by which I mean the free treatment of the comparatively well-to-do, is the crowding out of the poor, those for whom the charity is supposed to exist. The patient in whom the doctor sees possibilities, comes in for a goodly share of attention, that should be given to those less favorably situated. In other words, those who can pay for the medical attention deprive the deserving of what they need and have a right to expect.

The constitution of the state provided in Article VIII in Section 2 that any person who obtains medical or surgical treatment on false representation from any dispensary shall be guilty of a misdemeanor. How many at the present time are given an opportunity to make false representations, and how many have been brought to court on this charge?

Further, is it fair to the young medical man that he be required to devote his time and energies to the care of the poor of the state without compensation? The experience that he gains is supposed to be his compensation. In all other professions and in business, the young man gains his experience and makes a living at the same time. Physicians should be compensated for dispensary work. Nurses who may be employed are paid, the registrar is paid, even the scrub woman is paid. All receive compensation excepting the physician.

The present system of medical service through contract work, such as the care of members of lodges and their families, orders of whatever society, cheapens medical service, degrades the profession and gives very inadequate service to the supposed beneficiaries and the patient is the loser.

I am informed that the range of lodge compensation for a family for a year is thirty-seven cents per family to one dollar a year for man, wife and children. In some instances a physician will be employed by several lodges or orders. The character of the medical work done under these conditions, needs no description. Its effects upon the physicians are demoralizing. The fee-splitting evil is most openly practiced and it is the means of these lodge doctors' living income. Is it desirable for the county society to attempt control in this matter?

Legislation relating to the establishment and location of medical institutions is greatly needed. There is at present a decided tendency to centralize medical charities within comparatively small acreage on the east and west side of the city between Forty-second and Sixty-second streets. Such centralization, particularly of out-patient departments, means that all who apply will be treated, an increased abuse of medical charity. The Society of the Federation of Churches in New York City in 1905 and again in 1910 took a careful house to house census of the population of this district. They showed that in the period 1905 to 1910 between Forty-second and Sixty-second streets, Sixth avenue and the river, that there were in 1910, 1,160 fewer residents than in 1905, a diminution of density of population of more than twenty per acre of acreage. Two organizations are making an investigation at the present time with the idea of establishing control, relating to the distribution of medical charities and if necessary, the county society should co-operate.

Manhattan in its medical munificence now treats many of the well-to-do and a few of the

poor of the other boroughs, but that does not satisfy Manhattan. Its charity covers Westchester, Long Island and a large corner of New Jersey. If the city were divided into districts and the deserving treated in their own district and not given treatment elsewhere as is done with the tuberculous, much abuse would be prevented and the dangers of having the sick travel long distances in close contact with the travelling public would be done away with.

Probably no city in this or any country has a more efficient health department than New York. In its efforts in behalf of the public it is well to call the health department's attention to the fact that much care must be exercised in order that it does not contribute its share to the abuse of medical charity. To what extent the health department should practice medicine is a matter that should be definitely determined. Section 1170, Greater New York Charter, as amended by laws of 1909, Chapter 342, states that the board of health may cause proper care and attendance to be given to persons when it shall be made to appear to the board of health that any such person is so poor as to be unable to procure for himself such care and attendance.

The causes of indiscriminate medical charities are known to all. Selfishness is at the root of it and the degree to which the practice of medicine may be prostituted, is demonstrated by the following letter which was sent me by a member of this society.

The doctor writes as follows:

"The following blank was obtained from a friend who posed as an applicant desirous of joining the association. It is self-explanatory. You can see at a glance at what a disadvantage the decent medical man has to work when patients are treated at their homes free by regularly licensed doctors and when obstetric cases are handled by these men for \$10.00. There really ought to be some means by which these societies could be smashed and these doctors to be made to understand that such work as they are doing is unprofessional and unethical."

Received from

Name.....and family

Address

the sum of \$.25 membership fee into the above-named association.

Date.....

Agent's name.....

Immediate Benefit.

In consideration of the above receipt the.....
.....agrees to do for the member and his family the following:

1. Free medical treatment at the office during office hours of the above association.

2. Free medical treatment at the member's home between 9 A. M. and 8 P. M.

3. Prescriptions to be filled at the rate of \$.25 each no matter how expensive the drug.

4. In our dental department cleaning of the teeth of all the members of the family and all extraction with cocain (gas excepted) free of charge. All other work done at a reduction of 40 per cent. on bridgework, 35 per cent. on crown work and fillings and 30 per cent. on all plate work.

5. Free examination of the eyes by our eye specialist, and glasses furnished when necessary, at a reduction of 30 per cent.

6. Confinement cases, \$10.00.

7. Electric treatment, nominal charges, for members.

Unless you receive your contract within one week from date of this receipt, please notify the association, giving name of agent, amount and date when paid.

The result of it all is that through our ill-advised policies we pauperize the community, and lower the tone of the medical profession and force medical men who prefer to be ethical into fee-splitting, commercialism and illegitimate and criminal practice in order to make a living. Fee-splitting and advertising are to be condemned, yet, by doing so, we accomplish nothing. What we should do is to make conditions so that such practice will not be necessary.

The board of trustees and managers of medical charities must show large attendance at their various institutions, for advertising and other purposes. Attending physicians co-operate for various reasons which are well known to every medical man and they are not for the benefit of his medical brethren.

The remedy as applies to the physician is to have added to the statute the power of revocation of license for unprofessional conduct and have it defined in some such way as I have indicated. As to institutions and charitable bodies which entirely miss the true spirit of charity, that of serving the needy and those in distress, but instead do incalculable harm to an important body of men and harm the public, there should be some provision that they be disciplined, the extreme penalty being the revocation of their charters.

There should be some means of regulating medical charities, a commission to which they would be responsible.

Legislation.—In order for effective legislation to be brought about, there must be co-operation among the various medical bodies. All licensed physicians are interested in the same fundamental conditions and for legislative purposes, there should be a permanent joint committee, representing the various so-called schools of medicine. Legislators have repeatedly told me that de-

sirable legislation has often failed because of lack of unanimity on the part of physicians who appear before them; divided into groups, each so-called school presents its own claims and confusion ensues and there are no end results.

At the last meeting of the Comitia a letter was read from a member of the society in which the writer stated that he was eighty-three years old, poor and infirm and unable to pay his dues. He asked that the dues be remitted and that he be allowed to resign in good standing.

I would suggest that there should be an addition to the by-laws allowing the Comitia to permanently remit the annual dues in instances as this one so that a member may not be forced to resign because he is old and poor. This man, Dr. Young tells me, has been a member over thirty years.

In conclusion.—First it seems most desirable that the statute of 1806, adequate 106 years ago, be changed so that it may meet the necessities of 1912; and in this statute unprofessional conduct should be incorporated and defined.

Second, there should be some means of control of hospital, dispensary and medical charities, either by increasing the power of the State Board of Charities or through the establishment of a commission to which these organizations would be responsible.

HORMONAL, PERISTALTIC HORMONE (ZUELZER), AND ITS USES.*

By H. W. LINCOLN, M.D.,
BROOKLYN, NEW YORK.

ANY procedure which shall to any extent have beneficial influence upon constipation, which like the poor is always with us; and upon the intestinal paresis following operation, which is unfortunately of far too frequent occurrence, should be most heartily welcomed and given a thorough trial by the medical profession.

It is almost entirely with the application of Hormonal to the former condition that I shall speak.

Perhaps a few words in regard to the origin of the hormones may be pardoned. As far back as 1899 Wertheimer (Compt. rend. CXXIX 19; p. 737; 1899), has shown that the secretion of pancreatic juice may be brought about by the introduction of acid into the intestine even when nerve communication is cut off. This speedily leads to the supposition that some influence other than nervous was at work in the production of the digestive juices. It was also determined that the injection of acids directly into the blood stream did not bring about secretion. Hence, some other substance than the acid alone must

be necessary to stimulate secretion. The intensity of secretion diminished the farther down the intestinal tract the acid was introduced. All nerve communication having been cut off and secretion still appearing after acid introduction it became evident that the unknown quantity must be a chemical one, and furthermore that it must exist in the epithelial cells of the intestine. Bayliss and Starling, pioneer workers along these lines, therefore proceeded to scrape off and pound up with some dilute (about .4%) HCl. the mucous membrane of the intestine. An extract of this was filtered and injected into the venous circulation of the animal with the result that in a few moments a flow of pancreatic juice even greater than that produced by the direct introduction of acid into the lumen of the gut was observed. This substance formed in the cells and made active under the acid influence as is well known, is called secretin. It exists in all vertebrate animals, and can be demonstrated in any by simply macerating and boiling with a dilute acid the mucous membrane of the upper intestine. That it is not destroyed by boiling proves that it is not a ferment. The name "hormone" has been given to these chemical substances, being taken from the Greek word *ὁρμῶν* meaning to stimulate, to excite. They are also referred to as chemical messengers. The other hormones which have been proven to exist such as for example, the lacteal or mammary, the ovarian, and also the gastric, and the one regulating the blood pressure (epinephrin), which, according to a recent paper by Aaron (*Journal of the American Medical Association*, February 10, 1912), has received the most attention, are not necessarily to be considered here.

Zuelzer, G. (*Med. Klin.*, 1910; No. 11), was the first to recognize the specific effect which the peristaltic hormone had upon intestinal peristalsis. Hence, its employment in constipation and in post-operative paresis. It is found in the mucous membrane of the small intestine and is stored in the spleen.

The commercial product "Hormonal" is prepared as follows: *Journal of the American Medical Association*, July 22, 1911, in its valuable column headed, "New and Unofficial Remedies," says: "Hormonal, Peristaltic Hormone, Zuelzer; a liquid extract obtained from the spleen of an animal killed at the height of digestion. The animal is killed, *i. e.*, guinea pig, at a time when its digestion is at its highest point, the spleen is removed, macerated, pressed or extracted with physiological salt solution, or diluted HCl. (about .4%). The pressed out liquid or the neutral extracts are filtered under aseptic precautions.

"It is a yellowish liquid which is often turbid, but the slight flocculent precipitate does not appear to affect its efficiency. The liquid seems to be stable for at least one year, when protected from the light. It is claimed to relieve constipation and post-operative paresis, and injection at

* Read before the Caledonian Medical Society, February 16, 1912.

the time of operation is advised. It is still in the experimental stage."

Effect claimed to last 8 months, *i. e.*, in constipation.

The original dose was 20 c.c., injected either intramuscularly, 10 c.c. in either buttock or 10 c.c. in either ulnar vein. Latterly, however, the dose has been doubled, and furthermore Zuelzer has recently advised that it be used preferably by the intravenous method.

TECHNIQUE OF ADMINISTRATION.

After applying iodine well at the sites of injection, whether over vein or muscle, in the case of the former the needle is inserted its full length (1 15/16 in.), and the Hormonal is very slowly introduced. Little, if any, pain is experienced, and I have more than once had the patient ask when I was going to begin, after I had already inserted the needle. Each dose contains one quarter of one per cent. eucaïn hydrochloride which has some anesthetic effect. For intravenous administration a tourniquet is applied above the site of injection and if then the veins do not stand out well, having the patient clench his or her fist will usually bring them into sufficient prominence. It has not been necessary to cut down upon the vein. We have given Hormonal repeatedly in out-patient work with no untoward results. One case in which we gave it intravenously it was necessary for the patient to rest in the hospital for a few hours, for the reason that he became rather faint at the sight of the slight bleeding which ensued. Intravenous usage should, however, be confined to hospital practice, for the reason that sometimes there is considerable oozing.

There is some temperature reaction on the day of injection so that it would seem wise to give it, when practicable, early in the morning, as advised by the originator, in order that the normal temperature may return by night.

On the day of injection it is recommended to give two tablespoonfuls of castor oil in order to remove, or lubricate at least, the hard fecal accumulations which may be present. We have also in some cases given phenolphthaleïn in three to five grain doses in order to start things moving.

Hormonal is recommended in children as well as in adults, but I personally have had no experience in that line.

I have had the opportunity through the courtesy of some of my friends and in my services in the Swedish and Kings County hospitals and Polhemus Clinic to observe the results of Hormonal in about 25 cases, to be exact the total number is 26.

Zuelzer has recently reported 71 per cent. of good results. This is very much better than we have been able to do.

In the *Therapeutische Monatschrift* for November, 1911, there appeared a paper by Dr. Machtle in which he reports 24 cases divided as follows: Spastic constipation, 3; obstipation,

2; obstipation in lead colic, 1; atonic constipation, 14; mechanical obstruction, 2; pseudo ileus, 2. Among the atonic (which seems to be the most rational field for the operation of Hormonal), the longest period of relief was three months, and that with some interruptions, where mild catharsis was resorted to. One case waited five days before beginning to have stools. Of the spastic cases one had daily stool for two months, one for 2½ months, and in one there was no result.

Of the tabetic cases one had stools every one or two days, notwithstanding the fact that he was taking morphine for his pains. Another, a female, had stools at three to six day intervals. She was also taking morphine. The time this continued is not given.

In the case of lead poisoning, 10 hours after the injection, a stool followed without pain. During 14 days of observation good results were found. After this the patient was lost to observation. (This enters very largely into the difficulty of compiling any valuable statistics, as invariably the most interesting cases are bound to disappear.) Under the obstructive cases, we find one female with a tumor in the cul-de-sac of Douglass, which might possibly have compressed the intestine. Nevertheless, there was a good result from Hormonal. The other obstructive case bore no result.

Pseudo-ileus.—One male obstinate constipation; stool only every three to four days, and that after purgatives. For five days there had been obstipation, abdomen swollen on right side, rigid, and apparently resistant; 20 c.c. given in the veins. On the second morning two formed stools. After two days pause, but with wind passing, and oil injection given, soft stool was obtained. From this time regular daily stool occurred, which continued for three months. The second case under this heading, daily stools were obtained for four months after intramuscular injection. (This is longer than any results reported by this author in atonic cases.)

"In all cases except the lead colic, castor oil was given. In 18 there were good results and in six no results. The author expresses belief that Hormonal acts upon the muscle, increasing tonus, which tonus must thereafter be maintained by the physiological gastro-intestinal secretion, etc."

The above results would at least indicate that Hormonal is well worth a thorough and careful trial.

My own personal experiences with Hormonal dates from July 8, 1911, when we gave our first injection at the Polhemus Clinic. I will read a very brief report of the cases treated.

POLHEMUS MEMORIAL CLINIC.

1.—Male; aged 53 years; lighterman; tabetic with partial rectal prolapse. July 8, 1911, 20 c.c. intramuscular. Daily stools followed for one week, after which constipation returned. Pain was experienced at point of injection.

2.—Female; aged 18 years; fruit packer. Always constipated; atonic. August 24, 1911, 10 c.c. of Hormonal was injected into each buttock. Nothing more was seen of this patient until finally in response to inquiry she presented herself at the clinic, January 27, 1912. Since injection there had been daily stools until three weeks ago, *i. e.*, for about four months and one week, a daily result had been accomplished. During past three weeks, until five days ago, stool occurred every second day. Five days ago a dose of salts was taken, which is the first laxative taken since August 24, 1911. The patient admitted that latterly she had not been quite as attentive to going regularly to the toilet as formerly. She was given some general instructions and asked to report February 17, 1912, at which time if conditions warrant, we shall give a second injection.

3.—Male; aged 22 years; tailor; constipated for five years; atonic. October 24, 1911, intramuscular, 20 c.c. given. No result.

4.—Male; aged 26 years; shoemaker; constipated for three years; atonic. September 23, 1911, intramuscular injection given. October 21, 1911, he reported that since injection there had been five or six loose stools every other day, and no stool on the alternate days. October 28, 1911, he called to say that stools now occurred daily. December 9, 1911, *i. e.*, 2½ months after injection, constipation was back again. January 13, 1912, there is still constipation.

5.—Male; aged 43 years; gardener; ch. pyloric ulcer; operated some two years ago; also chronic constipation; spastic. November 2, 1911, injected intramuscularly with 20 c.c. Result, slight stool every second day without medicine, which lasted for about 10 days, after which constipated as ever. February 3, 1912, intravenous Hormonal was given with absolutely no result. At present this patient is in the Kings County Hospital undergoing the treatment of having one-half pint of warm olive oil deposited into the colon and retained over night.

6.—Female; aged 43 years; housewife; chronic atonic constipation. November 21, 1911, intramuscular injection of 20 c.c. was given. This case reported January 23, 1912, that after injection she would go regularly for two, three and four days without laxative, then a dose of salts would suffice for another three or four days. January 25, 1912, a second injection was given. January 30, 1912, report came of daily evacuations since second injection.

7.—Female; aged 44 years; housewife; always constipated. December 9, 1911, 20 c.c. given in the muscles. Good deal of rumbling in abdomen after injection which lasted a few days, but no stool.

8.—Male; aged 24 years; medical student; always constipated. December 2, 1911, intramuscular injection given with no result.

Cases 9, 10 and 11 were also medical students

in whom we got absolutely negative results. In two of these we gave second injections.

12.—A private patient of Dr. Andersen's, which he has kindly permitted me to include among those in which there was no result.

SWEDISH HOSPITAL.

13.—Male; aged 32 years; ch. rheumatism; dementia; atonic constipation; in the services of Dr. Lundbeck. October 14, 1911, 20 c.c. Hormonal were given in the muscles. From then until November 15, 1911, there were daily stools, but thereafter other aid was necessary to move the bowels.

KINGS COUNTY HOSPITAL.

14.—Male; aged 34 years; syph. January 27, 1912, 20 c.c. (10 c.c. intravenous and 10 c.c. intramuscular), with stools as follows: January 29, 1; 31, 1; February 1, 2; 2, 4; 3, 2; 4, 0; 5, 1; 6, 2; 7, 1; 8, 1; 9, 1; 10, 0; 11, 4 with castor oil; 12, 0; 13, 0; 14, 10 c.c. Hormonal in each ulnar vein, 2; 15, 0.

15.—Male; aged 23 years; pyloric ulcer; constipation. January 29, 1912, 10 c.c. in each vein. January 30, 1; 31, 1; February 1, 1; 2, 1; 3, 2; 4, 2; 5, 2; 6, 2; 7, 2; 8, 2; 9, 1; 10, 1. This man left the hospital on the 11th to report every week.

16.—Female; colored; aged 20 years. January 24, 1912, 40 c.c. given in the muscles. January 25, 3; 26, 2; 27, 1; 28, 1; thereafter no result.

17.—Male; aged 57 years. January 30, 1912, 10 c.c. intravenous. January 30, 1; 31, 2; February 1, 0; 2, 1; 3, 0; 4, 1; 5, 1; 6, 0; 7, 1; 8, 1; 9, 1; 10, 1; 11, 0; 12, 1; 13, 2; 14, 0; 15, 1.

18.—Male; aged 39 years. February 7, 1912, 40 c.c. intramuscular. February 8, 1; 9, 2; 10, 0; 11, 1; 12, 1; 13, 3; 14, 1; 15, 2.

19.—Male; aged 57 years. February 8, 1912, 20 c.c. intravenous. February 8, 0; 9, 0; 10, 0; 11, 0; 12, 1; 13, 1; 14, 2; 15, 1.

20.—Female; aged 20 odd years. February 8, 1912, 20 c.c. intravenous. No result.

21.—Female; aged about 25 years. January 23, 1912, 40 c.c. intramuscular. No result. Second injection intravenous, February 2, 1912. No result.

22.—Female; aged 30 years; tertiary syph. February 5, 1912, 20 c.c. in left arm (intravenous), the right arm being disfigured by burn. February 6, 1; 7, 0; 8, 0; 9, 0; 10, 2. February 10, 40 c.c. intramuscular. February 11, 2; 12, 0; 13, 1; 14, 1; 15, 0.

23.—Male; aged 30 years. February 5, 1912, 10 c.c. in each vein. February 6, 1; 7, 1; 8, 1; 9, 2; 10, 1; 11, 1; 12, 2; 13, 1; 14, 0; 15, 0.

24.—Female; aged 30 years. February 8, 1912, 20 c.c. intravenous. Left hospital February 13th with no result. There is a bare possibility of course, of effect appearing later, as more than one week has been known to elapse between time of injection and result.

Summary of county hospital cases: Some result in seven cases; positive result for a continued time in four cases; no result in four cases.

Two cases in which I have used Hormonal for post-operative paresis are as follows:

25.—Male; aged 42 years; janitor; operated by Dr. A. N. Thomson, October 9, 1911, for acute appendicitis. On the 10th there was some indication of trouble, the temperature being up (104.4), some abdominal distension, etc. Calomel given, and some other measures had been used. Dr. Thomson very kindly allowed me to give the intravenous injection of 10 c.c. in each ulnar vein, which was followed by copious evacuation which persisted daily until the patient left the hospital (Swedish), October 29, 1911.

26.—Male; aged 48 years; alcoholic and syph.; history, great drinker of whiskey and wines, also indulged in more than his share of venery. Operated, December 12, 1911, for chronic appendicitis by Dr. Chapman, through whose courtesy I am permitted to report the case. Every sign of paresis became apparent and on December 6, 1911, 20 c.c. Hormonal was given intravenously. The best that could be accomplished here was an increased intestinal peristalsis, with expulsion of some gas, but no satisfactory stool, and the patient died. Post mortem revealed an atrophic liver, no mechanical obstruction of the bowel.

AFTER TREATMENT.

As is well known, the rectum does not normally contain fecal material. When the pelvic colon which becomes filled from below upward, empties into the rectum then comes the sensation, produced by stretching of the muscular fibres, known as muscle sense (Hertz), spoken of as the "call to defecation."

This occurs normally in the morning after having taken something into the stomach, and in some individuals also after other meals; the mere fact of anything hot or cold going into the stomach being sufficient to bring about this desire for emptying the bowel.

It stands to reason that this inclination should be immediately heeded, for if neglected, the rectum after a time becomes accustomed to the increased pressure by its contained mass, and an atonic condition may ensue.

This neglect to nature's call is of very common occurrence, particularly in women, and I mention it here because I believe that some at least of our failures with Hormonal have been from inattention to this one point alone. The call is not always of very much intensity and in the average out door department, or hospital patient, may be easily overlooked. Again, people of this class expect that the injection is going to produce the desired result unaided in any way, and if an unbearable griping pain does not force them to go to the toilet they will not trouble themselves. It becomes, therefore, very neces-

sary to impress upon the patient that he or she must help in the Hormonal treatment of constipation as much as in any other method. The diet should be somewhat coarse, in the form of breads containing bran, graham or rye flour, green vegetables, plenty of butter, olive oil, plenty of water, etc., and out of door exercise, together with, in some cases, abdominal massage should be thought of.

As cases are on record in which there has been no effect for some days, or even a week, it is well to tell the patient that there may be no immediate result.

Morphine should, of course, not be given as it would tend to lessen the effect of the Hormonal.

In obstinate cases in which there has been a result from the injection which has lasted over several weeks and then relapsed, an occasional dose of phenolphthalein or some other mild laxative will often appear to start the bowels moving again for anywhere from two or three days to a week. Even this is an improvement over the regular daily dose of medicine. At the present time the great disappointment lies in the fact that Hormonal effect does not persist for more than a few months even in favorable cases. On the other hand, many persons would prefer to receive an injection say, four times a year, than to be continually obliged to take medicines or enemata. Like so many things in medicine, time must play a most important part in this new method of treatment, and I trust that in another six months or so we shall have reports from the experience of a sufficient number of men to warrant our continuing or abandoning Hormonal for the management of constipation.

Thus far in cases in which the first injection has produced no results, a second has been of little value.

Out of the 26 cases treated, we have some show of success in exactly 13, or 50 per cent., which, as I said in the beginning, does not come up to the 71 per cent. claimed by the originator of the method. There is, however, no doubt but that had we been able to observe all our cases as we did those in the Kings County Hospital, our number of successes would have been larger. Some of those at Polhemus never returned after the injection, so that, of course, they must be charged up to the negative column.

Our longest period of regularity in bowel movement is four months and one week. This case is to report again tomorrow. The next longest time is two months and two weeks, after which the old trouble returned. One case benefited so that a dose of medicine became necessary at two, three or four day intervals instead of daily.

One case "cure" lasted for one month.

Three patients are still under observation after having gone along well for two weeks.

One case went for ten days with an occasional intermission, and is yet under observation.

Three have gone nicely for one week and are still being watched.

One patient went to stool daily for one week and then stopped.

One case of post-operative paresis apparently beginning, went on to uninterrupted recovery after the intravenous injection. This man left the hospital 19 days after the Hormonal was given.

APPENDIX.

Since reading the above paper I have continued and am still continuing my investigations, and I therefore wish to add the following:

Case No. 14 had evacuations daily with two exceptions up to and including February 28th, when he left the hospital, promising to report weekly. Three of these days he had two stools, one day three stools, one day four stools.

Case No. 15 reported daily stools at the end of the first week out of the hospital, but failed to report last week.

Case No. 17 has had daily stools up to February 26th, when he left the hospital promising to report weekly. On three days from February 16th to 26th there occurred two stools daily.

Case No. 18 as follows: 16, 0; 17, 0; 18, 2; 19, 1; 20, 0; 21, 0; 22, 0; 23, 1; 24, 1; 25, 0; 26, 0; 27, 1.

Case No. 19. There have been daily stools with four exceptions until February 28th, and the case is still under observation.

Case No. 23 shows daily stools to and including February 28th. Two stools daily on six occasions; three stools on one day and four stools on one day. This patient is still under observation.

Case No. 2, which was given an intra-muscular injection on August 24, 1911, reported February 17, 1912, to the effect that there were daily stools without further medicinal help. We did not, therefore, give second injection.

Case No. 14 would seem to indicate that the second injection was of some value.

I desire to thank Dr. C. B. Vogt for interest shown in watching the cases at the Kings County Hospital.

ADVANTAGES OF NATIONAL QUARANTINE.*

By LELAND E. COFER, M.D.

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Mr. President, Members of the Academy, Ladies and Gentlemen:

IT is not my purpose to read a regular paper before you tonight, but I will endeavor to explain, as briefly as possible, the national system of quarantine, and the advantages which I believe are peculiar to it. Nor is it my pur-

* Read before New York Academy of Medicine, at New York City, February 1, 1912.

pose to comment upon the quarantine systems of states, nor to make comparisons between them and the system operated by the Public Health and Marine Hospital Service, which service I represent, and which, as you all know, is a bureau under the Treasury Department.

Quarantine may be defined as an institution which prevents or modifies the transmission of disease from one locality to another by the imposition of certain restrictions upon commercial intercourse. While quarantine is an offspring of medical science, it only thrives when communities allow themselves to be infected by quarantinable diseases, and its operations are unfortunately not then directed against the communities so infected, but rather against the social and commercial intercourse existent between them. This is unfortunate, and causes quarantine to be considered of such a palliative nature that progressive sanitarians are ever looking forward to the time when internal sanitary conditions will be developed to such a point that medical science will be warranted in dropping quarantine as an obsolete and unnecessary measure. Fortunately sanitation is keeping pace with the other sciences in the march of progress, and students of sanitary science are making wonderful predictions as to the many radical reforms in public health work which the future has in store for us; but it is also true that these reforms, if at all general in their extent, can only be brought about by much education and persuasion of the people at large, and therefore the interim, which under these conditions may be a long one, must be utilized in bringing about the desired result, while public health work is continued for the time being along accustomed lines. That is to say, until we reach a state of general municipal cleanliness, whereby our sanitary conditions will insure immunity from quarantinable diseases, either in epidemic or endemic form, quarantine as an institution must be maintained.

It may be said that prior to the passage of the Act (approved February 15, 1893) "granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service," there was no national system of quarantine. Prior to 1893, the various state governments and later the county and municipal governments, as the case might be, conducted their own quarantine systems. It is true that there was some national legislation along the lines being discussed, but all the Acts of Congress up to the one I have just mentioned, namely, that of February 15, 1893, relating to quarantine specifically, provided that the national measures were in the aid of the state and local authorities. In other words, quarantine was permitted to be exercised by the states as a police function, notwithstanding the opinions held by the national legislature as to their rights in the premises, and it will be seen that in the present law, the Act of 1893, it is provided that assistance shall be given to the

states and municipalities by the United States government, the supremacy of the latter to obtain only when the state and local authorities fail or refuse to enforce the minimum of regulations provided for by national law. It is not my purpose in these remarks to go into the disadvantages which did accrue or could easily now accrue under such a varied system of operating quarantine, but if the system had not been faulty and a burden upon commerce, not nearly so many states would have transferred their quarantine functions to the custody of the national government.

In the Act of 1893 the Secretary of the Treasury is empowered to promulgate uniform quarantine regulations for the ports of the United States, to be enforced by the state or municipal authorities, provided they will undertake to enforce them. The provision is made also that in the event they refuse or fail to enforce these regulations, the President is directed to detail or appoint officers for this purpose. The law further provides that the Surgeon General of the Public Health and Marine Hospital Service, under the direction of the Secretary of the Treasury, shall perform all the duties in respect to quarantine which are provided for by the Act. At a large number of ports the quarantine has been given over voluntarily to the national government, which exacts no fees, and at other ports the national government has assumed charge by virtue of the law, and because of non-compliance with the regulations.

In 1888 a site was purchased (Fisherman's Island) for the quarantine station at Cape Charles, Virginia, the boarding station being maintained at Fort Monroe, Va.

In 1883 quarantine stations were established under national auspices at Ship Island, Miss., and on Blackbeard Island, Sapelo Sound, Ga., the latter being known as the South Atlantic Quarantine Station.

In 1889 the Delaware breakwater quarantine was ceded by the state of Delaware. In the same year (1889), maritime quarantine matters at San Diego, California, were absorbed as a national function, the site for the national quarantine station at that port having been purchased from private parties.

In 1890, by the act of Congress of April 30, of the same year, which Act is known as the organic act for Hawaii, the quarantine station, as well as the quarantine functions at Honolulu, Hawaii, and other ports in the Hawaiian Islands, were transferred to national control.

In 1891 the quarantine station at San Francisco, Cal., was turned over to the national control.

In 1892 maritime quarantine functions at Port Townsend, Wash., were transferred to national control.

In 1893 the quarantine station at Reedy Island, Delaware, was erected (this station affords protection to Philadelphia).

The year 1899 marked the transfer of quarantine functions at the ports of Astoria, Ore.,

Savannah, Ga., and Southport, N. C., to national control.

In the same year the quarantine system in Porto Rico was placed under the operation of the national government.

In 1900 Brunswick, Ga., relinquished its quarantine functions in favor of the Treasury Department.

In 1901 the whole quarantine system for the state of Florida was transferred to national control.

In 1903 the quarantine function at Portland, Maine, was transferred to national control.

In 1907 the following ports relinquished their quarantine functions: Mobile, Ala., and New Orleans, La.

In 1908 similar action was taken at the ports of Charleston, Georgetown, Beaufort and Port Royal, S. C., and finally in 1910, a site was acquired from the War Department for the construction of a quarantine station at Galveston, Texas. This station is now under construction and will be in operation under the auspices of the Public Health and Marine Hospital Service in the course of nine or ten months.

It will be seen that the quarantine functions at all of the ports of the Atlantic, Pacific and Gulf seaboard are being operated under national control, by the Department of Treasury, under the Bureau of Public Health and Marine Hospital Service with the following exceptions:

1. Port of New York,
2. Port of Boston,
3. Port of Baltimore,
4. Port of Providence, R. I.

It has been often wondered at that the Treasury Department, the operations of which are generally supposed to be devoted exclusively to national financial problems, should be charged with the conduct of quarantine, an almost purely medical function. It may be said that if there are no other reasons for this, which is not admitted, there is probably no other department, which, by virtue of its control over other allied services, is so well equipped for the conduct of quarantine. I refer to the customs service and the revenue cutter service, which aid in the carrying out of quarantine regulations. For example, all vessels from foreign ports must, before the discharge of their cargo or passengers have been legally entered by the Collector of Customs at each port. Therefore the Collectors of Customs may refuse entry or otherwise assist the quarantine officers in enforcing the quarantine regulations, in conjunction with their customs regulations.

As stated above, it is always possible for the Secretary of the Treasury to utilize the revenue cutter service when necessary as an auxiliary in connection with quarantine work.

The revenue cutter service is for practical purposes a naval organization, and the character of assistance which they are at any time able to

render could not be paralleled in any other quarantine organization, than one conducted under national auspices.

I will now endeavor to give a brief outline of the manner in which the national quarantine is conducted. The above mentioned act of 1893 requires that every vessel leaving a foreign port for the United States shall have a bill of health in duplicate, signed by the United States consul at the port of departure. This bill of health contains much information concerning the health of the port of departure, the diseases prevailing at that port for the two weeks prior to the date of the issuance of the bill of health, and special information concerning the sanitary condition of the vessel, crew, passengers and cargo. This bill of health is attached to a certificate which states that the vessel has complied with the regulations for foreign ports, promulgated by the Secretary of the Treasury under the act of February 15, 1893. These regulations are such as to insure, as far as practicable, that the vessel is not a carrier of quarantinable disease. If the vessel does not obtain a bill of health, or if, upon application for same, the consul is unable to affix his signature, because of the fact that the terms of the said bill have not been complied with by the vessel, the said vessel is subject to a fine not to exceed \$5,000 upon entering at a port of the United States. It may be said in this connection that in the national quarantine establishment there is no such document recognized as a foul bill of health. The vessel must be safe in the opinion of the consul before the bill of health is granted. In other words, as far as possible, a consular bill of health is a good bill of health.

At certain foreign ports and at certain times, depending upon the presence of the various quarantinable diseases, either in the foreign ports of departure or in the country contiguous thereto, officers of the Public Health and Marine Hospital Service are detailed by the President to serve in the offices of the American consuls, to assist them in enforcing the quarantine regulations for foreign ports. For example, during the summer just past, on account of cholera conditions prevailing in Italy, Russia and France, there were officers of this service detailed in the offices of the American consuls at Naples, Genoa, Palermo, Messina and Catania, in Italy, at Libau in Russia, and at Marseilles, France. In addition to this, officers were ordered to several other foreign ports of departure, there to confer with the American consular officers as to the enforcement of the regulations for foreign ports, and for the purpose of insuring uniformity of procedure.

In this connection it may be said that the officers of the Public Health and Marine Hospital Service are maintained constantly at such ports as Calcutta, India; Honkong, Shanghai and Amoy, in China; Yokohama and Kobe in Japan; Salina Gruz, Manzanillo and Puerto Mexico in

Mexico; Guayaquil, Ecuador, La Guaira, Venezuela and Havana, Cuba.

The State Department has done much to assist the Public Health and Marine Hospital Service in the quarantine and sanitary work in foreign ports, through the interest it has aroused in the said work on the part of its consular corps. There was a time in the past when a number of American consular officers, perhaps through unfamiliarity with the quarantine regulations, were not as potent a factor in national quarantine work as they are today, but too much praise cannot be given for the interest which many of the members of the consular service exhibit, both in the prompt reporting of the presence of quarantinable diseases in foreign countries, and in the intelligent and conscientious enforcement of the treasury regulations. The consular bureau of the State Department invariably invites an officer of the Public Health and Marine Hospital Service to appear before its classes of consuls to explain the requirements of the regulations and to answer questions concerning the enforcement of them. With this growing knowledge of the work which is now possessed by the consular corps as a whole, individual consular officers may be directed by cable to put into immediate effect whatever regulation or regulations for foreign ports the local sanitary conditions demand. Furthermore, it is possible for the consul himself, upon learning of the presence of epidemic disease at his post, to put such regulations into immediate effect to save loss of time, and to cable his action for approval.

Now, I have mentioned that the consuls in all the foreign ports forward through the State Department, to the Public Health and Marine Hospital Service, information as to the presence of quarantinable disease and also general public health statistics. This information may be sent by letter, but if very important, it is invariably sent by cable, and this, and all other information of a like character obtainable, is incorporated into a weekly publication, published by the Treasury Department, known as the weekly Public Health Reports. These reports are edited carefully, and upon issuance from the Public Printer are mailed promptly, so that the quarantine officers at the various United States ports are put in possession, either through these reports, or else by special telegraphic information from the bureau, of any information concerning the sanitary condition of foreign ports which will be of assistance to them in judging as to the requisite quarantine treatment to be accorded a vessel arriving from a foreign port.

To give you an idea of the work done in foreign ports either by the joint action of the officers of the service and the consular officers, or else by the consular officers themselves, during the past summer all passengers from cholera infected localities were caused to be detained at the foreign ports of embarkation for five days

in barracks especially adapted for this purpose. Prior to the detention of these passengers their baggage was searched and foodstuffs and bottled waters carried in hand baggage were eliminated, and where necessary, the baggage of these persons was subjected to disinfection, the passengers being subjected to a daily medical inspection, and to a final medical inspection just prior to the sailing of the vessel. In ports of departure wherein plague prevails treatment of a similar nature is accorded the outgoing passengers, with special variations on account of the incubation of the disease, and the relation which rats and vermin bear to the dissemination of it. For example, where passengers are detained five days for cholera, they are detained seven days for plague, and where special care is taken to remove foodstuffs in the case of cholera, special care is taken for the destruction of rats and vermin in the case of plague.

The quarantine regulations contain a number of requirements to be observed by vessels at sea, said requirements having been many times the means of determining the early discovery of quarantinable diseases occurring enroute, with the resulting isolation of such cases, and the performance of the proper disinfection, all of which has served to mitigate the quarantine restrictions enforceable at the time of the arrival of the vessel. Upon the arrival of the vessel at a port in the United States, an inspection of the vessel, personnel and cargo is made along lines which vary somewhat according to the port and the time of the year, but which on the whole are uniform, in that the following facts are made to enter into the judgment of a vessel, and I would like to say here that one of the advantages which I shall name later on for national control of quarantine work, is the steady and progressive education of officers, who are members of a corps devoted somewhat exclusively to this work, in learning to deduce, from facts obtained upon the arrival of a vessel, the sanitary conditions of the latter.

There is far more to this process than the average layman would believe until he had taken the trouble to investigate the matter. Unfamiliarity with quarantine principles on the part of the laity unfortunately, but almost invariably, takes the form of antagonism, so that not an inconsiderable part of a quarantine or sanitary officer's time is occupied in making explanations of his official acts. On the other hand, it must be admitted that the layman has grievance against a public function, toward the support of which he is expected to contribute, when said function enforces a restraint concerning the rationale of which he is kept in ignorance.

I will now enumerate the factors which we have by a long process of education instilled into our officers for their consideration in determining the sanitary status of a vessel.

1. The facts concerning the sanitary status of

the port of departure, which are obtainable from the bills of health, the ship's papers, the public health reports, and special information sent from the Bureau of Public Health and Marine Hospital Service.

2. The facts gathered from the personal observation on the part of the quarantine officer, of the ship and its personnel.

3. Suppositions based upon

- a. The sanitary history of the voyage.
- b. The likelihood of latent infection.
- c. The reputation of the captain of the vessel.
- d. The likelihood of concealed infection.
- e. The attitude of the ship's surgeon.
- f. The kind of cargo carried.

I have mentioned latent infection. I mean by this term the presence on board the vessel of plague-infected rats, or perhaps infected yellow fever mosquitos, which vermin and insects, as the case may be, have not up to the time of arrival, caused the infection of any of the personnel of the vessel.

Now, after the completion by the quarantine officer of the medical inspection of the vessel and the personnel upon arrival comes another inspection also made by the officers of the Public Health and Marine Hospital Service, namely, the medical inspection of aliens for the determination of diseases deportable under the immigration laws. This latter inspection, while it is not an inspection for the detection of quarantinable diseases, often proves of the utmost value in the detection of cases of such diseases occurring later than would reasonably be expected. There are on record a number of instances where quarantinable disease had been found amongst immigrants, the detection of which had been impossible in the regular quarantine examination given previously. There is a provision in the regulations governing the notification of the local health officers at the various points of destination of passengers arriving on vessels infected with quarantinable disease.

I regret that I have not the time to more fully describe the operations of the national quarantine system, but I hope that I have given you some idea of its extent and scope.

I will now say a word about the organization of the corps which operates the national quarantine system, and will then give you a summary of reasons why it is of advantage both to commerce and to the public interests that maritime quarantine should be operated by the national government.

The Public Health and Marine Hospital Service is under the supervision of the Secretary of the Treasury, and is in charge of the Surgeon-General, who has six assistant surgeon-generals in charge of the bureau divisions. These divisions are as follows:

1. Foreign and Insular Quarantine and Immigration.

2. Domestic (Interstate) Quarantine.
3. Personnel and Accounts.
4. Marine Hospitals and Relief.
5. Scientific Research and Sanitation.
6. Sanitary Reports and Statistics.

Each division has special office quarters, and a special clerical force. All of the officers in the outside service, whether at foreign ports, insular possessions, quarantine stations, immigration stations, those engaged in suppressing epidemics, in conducting the marine hospital relief stations, or in scientific investigations of disease in the field or in the laboratory, come under the jurisdiction of one or the other of these divisions of the bureau. The operations of the divisions are co-ordinated and brought under the direct supervision of the Surgeon-General by special bureau regulations.

It is not pertinent in this connection to refer to the operations of any of these divisions except one, and that is the one devoted to foreign and insular quarantine. Through this division, during the fiscal year just passed, 15,160 vessels were inspected, involving the inspection also of 1,516,445 persons (passengers and crews) and the disinfection of 1,801 vessels on account of actual infection or for the destruction of rats and mosquitos, the carriers of plague and yellow fever. This division also supervises the medical inspection of immigrants, this point being again brought to your attention as being an important factor in the amplification of the regular quarantine work. During the year ended June 30, 1911, 1,093,809 immigrants were inspected, and 14,738 immigrants rejected on account of diseases deportable under the immigration laws.

The Public Health and Marine Hospital Service is composed of 135 commissioned officers, 283 acting assistant surgeons and 1,014 men. Representatives of this corps will be found either in marine hospital, immigration or quarantine stations, and perhaps all three, in every port and in the important cities and towns bordering upon the Canadian or Mexican frontiers. The officers are only admitted to the corps after passing a rigid physical and mental examination. They are then transferred to some large station for special training, and as soon as possible transferred to the Hygienic Laboratory at Washington for special training in bacteriology, especially the bacteriology of the various quarantinable diseases, so that when an officer of the Public Health and Marine Hospital Service is detailed for regular duty at a station he has already received special training for the work. In other words, in the conduct of quarantine stations the officers of the service are not unlike the officers of the navy, in that an officer may be transferred from station to station and become familiar almost immediately with the details of the work in the same sense that a naval officer may be transferred from a cruiser to a battleship, and in a short while become familiar with his new surroundings.

The service at the present time operates 46 quarantine stations, extending along the Pacific, Gulf and Atlantic seabords from Alaska to Maine. In addition to this it operates the quarantine systems in the Philippine Islands, Hawaiian Islands and in Porto Rico.

The diseases at present quarantined against under national law are cholera, yellow fever, smallpox, typhus fever, leprosy and plague.

While some of our quarantine stations are inspection stations only, many of them are large institutions, comprised of barracks for the detention of crews and steerage passengers, quarters for the detention of cabin passengers, hospitals and camp facilities for the quarantining of troops. In addition, there are the usual wharves, disinfecting machinery, boarding vessels, etc. All of this requires good administrative ability on the part of the officers of the service, which is demanded of them in addition to a technical knowledge of medicine in general, and of the quarantinable diseases in particular.

Now for the reasons why it is advantageous for maritime quarantine to be under national supervision.

1. Uniformity of quarantine regulations and quarantine procedure. An extensive paper might be written upon this subject alone, but I have only time now to point out that it is of distinct advantage year in and year out, both for the commercial and sanitary interests, for the quarantine functions to be operated by one corps of officers under one set of laws and regulations. The tendency under these conditions is to have every one affected by quarantine laws, that is, the quarantine officers, the municipal or local health authorities, and the mercantile marine interests, develop amongst themselves team work along the lines under consideration. It must mean a great deal to the maritime interests to be familiar with what is required of them, and to know that once they are familiar with the quarantine operations in one port, it applies to all ports alike, and it is of great advantage to the quarantine officers to know that the mercantile interests understand the code under which quarantine is administered. There is no doubt that by the team work which is possible under these conditions much time can be saved, which is equivalent to saying that much money will be saved, to say nothing of the advantages which accrue to the public through the prevention of the introduction of quarantinable diseases, with as little embarrassment as possible to commercial and social intercourse.

2. The Treasury Department by correlating the work of its Customs Division and Revenue Cutter Service Division with the quarantine function is able to furnish the latter with the maximum amount of assistance and dispatch.

3. The national quarantine establishment is in direct touch with all parts of the world, through the courtesy of the state department and its consular bureau, and publishes a weekly bulletin de-

voted to sanitary reports and statistics. While the state quarantine officers have access to these bulletins, they cannot possibly be in such close touch with the sanitary conditions of the world as can the officers of the Public Health and Marine Hospital Service.

4. The quarantine officers in the national service are appointed for life, consider themselves residents of no place in particular and are non-partisan in the performance of their official duties. Their time and their mental activities are devoted to their work and they are not disconcerted by fear of removal from office. Their acquired knowledge of marine architecture, nautical usage and maritime conditions enables them to adjust in perhaps a judicial way, the many differences of opinion and difficulties which arise in the enforcement of quarantine laws upon maritime commerce. A quarantine officer might be ever so well versed in the diagnosis of quarantinable disease and in the technical treatment of the vessel, but if he has not the knowledge of the manners and customs of seafaring men, of the difficulties under which vessels are run, of the necessity for saving time to vessels, of the necessity of not being arbitrary in the face of adverse winds, weather, lack of coal and water supply and other conditions which must be faced in connection with this work, the usefulness of such an officer in the long run would be extremely doubtful.

It has been the endeavor of the service to create a genus which may be termed a "quarantine officer," which, in the broadest sense would designate a well-appointed medical man, versed in maritime conditions and usage and gifted with executive ability and tact. Fortunately the service at this time has a number of such men, and when a man of this kind is needed in a particular place his services are immediately available.

5. Previous mention has been made of the supplemental quarantine work invariably performed by medical officers of the service engaged in the medical examination of arriving aliens. This is again mentioned as an important factor in the advantages of the national control of quarantine. In other words, the public at large, the maritime interests and the quarantine function at a given port must receive in the long run great benefit from having both the quarantine and immigration examination conducted by the same set of officers in a uniform manner.

6. In the matter of expense, it would appear that if a state would ask the nation to conduct its quarantine service, simply to save money, the only benefit to accrue would be to the maritime interests and to the individual state. On the other hand, if a state would elect to transfer the quarantine function to national control, in order that the money previously spent for maritime quarantine purposes could be diverted for the betterment of intrastate sanitary conditions, then this reason alone would seem sufficient for every

state turning its maritime quarantine over to the nation as a whole. It may be mentioned as a reason for national control of quarantine, that no fees are charged to vessels, either for inspection or for quarantine treatment. This fact may be of some interest to the steamship companies, and would doubtless be given by them as an important reason for national, as against state, control. From a service standpoint this is considered of no consequence, for the reason that this question should be viewed in its broadest sense.

7. An important feature in connection with the national control of quarantine is the fact that the subject is being closely studied from many viewpoints, and the Hygienic Laboratory at Washington is being called into constant use for the purpose, not only of giving technical instruction to officers as above mentioned, but in simplifying the regulations and restrictions in accordance with the growth of knowledge as to quarantinable diseases and their methods of transmission. Then again, by the intimate touch which the bureau at Washington keeps on the work going on at the various quarantine stations, the carrying out of quarantine regulations by rule of thumb methods is being discarded and quarantine at individual ports, indeed, at times on individual vessels, is being carried out with special reference to the actual conditions existing at the time.

I feel that I must bring this paper to a close, because it is almost unfair to say this much without saying more, for the reason that the subject is a very broad one, and on account of the fact that quarantine as a function is so little understood, a discussion of the subject should be more in detail than is possible in the ordinary time given to the reading of a paper. However, if I have given you even a general idea of the views which we hold in Washington in regard to this matter, I shall be satisfied, and in any event I desire to thank you for your kind attention.

THE RONTGEN RAYS IN GASTRO-INTESTINAL EXAMINATIONS.*

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THE Rontgen rays are continually increasing in their usefulness in internal medicine. The delicacy of the rays in examining the lungs has long been recognized. Orthodiagraphy and tele-rontgenography is making the rays valuable in cardiac and vascular lesions, while the employment of bismuth with fluoroscopy and the instantaneous radiography made possible by im-

* Read before the Fourth District Branch of the Medical Society of the State of New York, at Ogdensburg, October 10, 1911.

provements in X-ray machines, has opened up a new era in the examination of the gastro-intestinal tract.

Formerly we contented ourselves with merely outlining the position of the stomach and intestines and noting the length of time it took for the bismuth to pass a given point or to note the locus of a very marked obstruction. With instantaneous radiography, however, it is practical to accurately register the individual peristaltic waves on the lesser as well as the greater curvature of the stomach and even the rugæ of the stomach can be demonstrated. Previously the peristalsis has been studied to some extent fluoroscopically, but the outlines on a fluorescing screen under the most favorable circumstances are not as distinct as the impression obtained upon a radiograph. While many details are lost on the screen, by radiography all detail is saved and by taking radiographs in quick succession, all stages of the intestinal movements can be obtained in the form of a permanent record which can be studied later, or can be reproduced in a cinematograph if the importance of the case warrants it.

Owing to the interference with the peristaltic waves and rugæ caused by the induration and splinting of the intestinal muscles in cases of ulcer and early carcinoma, the irregularity of contour in the interior of the viscera in cases of adhesions, contractures and tumor, the X-ray method will become of increasing importance in examining gastro-intestinal cases as our experience grows and our interpretation establishes its trustworthiness and accuracy.

The location of strictures in the œsophagus, cardia, pylorus, and their differentiation from spasms, the demonstration of the true position of the stomach and intestines in contradistinction to that so long accepted because of the teaching of text-books, have now become such common procedures that they do not cause the wonder they once excited. The normal or "steer-horned" stomach is now known to be so rare that we don't expect to find it and, in fact, are pleasantly surprised when we do. The vertical or "fish hook" stomach with the greater curvature on a line with or below the umbilicus, is beginning to be accepted as the usual shaped stomach to be encountered; although it cannot be considered normal, it escapes criticism because investigation shows that the majority of the human race has that kind of a stomach.

In recent medical literature much attention has been devoted to the roentgenologic examination of the stomach, bronchoscopy, and œsophagoscopy, the equally important subject of the roentgenographic examination of the colon with sigmoidoscopy and proctoscopy have been comparatively neglected. My attention has been particularly called to the value of these procedures in my observations of a series of cases of obstipation and chronic constipation.

Technique.—The essentials of the technique are a good roentgenological equipment with arrangements for making fluoroscopic and radiographic examinations of patients in the erect as well as the horizontal position; the patient and the observer being adequately protected. I have found it convenient to do my work in rooms that are day-light proof as well as X-ray proof so that one is always protected from the X-rays and white light can be admitted at will or supplied by electricity when desired. The equipment for such observations has not yet been standardized and at present each operator adapts his laboratory conditions according to his own ingenuity. I have found that the Hænisch Toroskop gives good facilities for examining the patient in the horizontal position and the Albers-Shoenberg "Casette" or Beclere "Stativ" combined with suitable lead covered barriers, give good results in examining patients in the erect position. All of these apparatuses are large, cumbersome as well as expensive; requiring the spaciousness of a "laboratory" or, as the Germans have it, an "institut." It can hardly be accommodated in the ordinary physician's offices, but I believe that simpler apparatus adapting the principles of the camera used for photographing rapidly moving objects, to radiography, will be evolved and simplify the technique and equipment considerable.

The patient should be prepared for examination by three days of thorough catharsis. At the time of examination, bismuth sub-carbonate is administered in suspension of buttermilk or mucilaginous mixture. If given by mouth, the patient should be fluoroscoped in the erect position and the radiographic records may well be made in the same position. The exposures must be instantaneous (one-fifth of a second) in order to get an accurate registration of the character of the peristalsis and folds of the mucous membrane. Some operators believe that the fixation of the abdominal walls obtained by having the patient lying prone in the horizontal position during the radiographic exposure repays them for the additional trouble of fluoroscoping the patient in the vertical position, and radiographing the patient in the horizontal position. The operator should be able to fluoroscope or radiograph the patient in either the vertical or horizontal position.

Many of the erroneous teachings of anatomy have arisen from the study of dead bodies in the horizontal position and in the employment of this new method of examination we should avail ourselves of the opportunity of studying the viscera in living bodies in the position man occupies sixteen out of twenty-four hours. If the bismuth is given per rectum, the examination fluoroscopically and radiographically should be made with the patient in the horizontal position.

In normal cases, the bismuth begins to appear in the cæcum about two hours after ingestion; the colon is partially filled and its position de-

fined, about eight hours after the bismuth is ingested and is completely filled 18 to 24 hours after ingestion. In nervous cases with hyperperistalsis the bismuth may appear in the cæcum earlier than this and in cases of constipation and obstipation the bismuth may reach the colon later, according to the nature of the case. In the ordinary cases of chronic constipation there is usually little delay in the appearance of the bismuth in the cæcum and most of the motor insufficiency is shown in the transmission of the bismuth through the colon. The common position of the transverse colon is on the level with or a little below the umbilicus and we find that the flexures are only "hepatic" or "splenic" in name, as one or both are commonly posed much below either the liver or the spleen; in fact, it is an open question whether the normal position of the flexures is to be desired because in such cases the intervening loops of the colon are so posed that acute angulations present at the flexures so that the progress of the fæcal current appears to be impeded.

The accumulation of fæces in the cæcum and its delay at this point is very noticeable in all cases of chronic constipation. The bowel contents seem to lodge at this point and the cæcum appears to act as a retention reservoir for too long a period of time. This distension and dilatation is so constant and so noticeable in radiographs of such cases that I have frequently referred to this condition as a "lake" or "Lake Constipation." The colon is largest at this point and grows progressively smaller as it approaches the rectum. The fæcal current, like streams of water, moves faster in the centre than along the sides and it will sometimes be observed that large and small collections of bismuth will remain stationary for days along the walls of the colon particularly in the cæcum. I feel sure that this stagnation of the fæcal current in the cæcum has a very direct bearing on the etiology of appendicitis, and explains the frequency with which palpation in the right iliac fossa elicits the gurgling of gas through liquids with splashing and some dull pain. When retention of fæcal contents is so common at this place for so long periods of time, associated with the dilatation, gas formation from putrefactive organisms, the wonder is that appendicitis does not occur in a larger percentage of the human race than it does.

When the lumen of the appendix is patent, bismuth will frequently be carried from the cæcum into it, which would seem to verify Cannon's observation of antiperistaltic waves occurring in the appendix. The observation of the progress of the fæces through the colon cannot fail to arouse in us the importance of "sewage disposal" in man.

The commonest sites of delay in the progress

of the intestinal contents through the colon are, first, at the sigmoid flexure; second, in the ampulla of the rectum; third, in the transverse and descending colon. The accurate localization of delayed transit in the fæcal current, or kinks, or flexures, has an important bearing on the treatment of the individual case and in most instances will supply valuable information as to the most successful method of treatment whether surgical or medical. The fluoroscopic examination of the rectum while a bismuth enema is being given is a particularly important procedure in all cases of obstruction of the colon. By this method one can easily satisfy oneself of the fact that fluid introduced beyond the sphincters, goes promptly as far as the cæcum unless something abnormal obstructs it. This observation has a very important bearing on the administration of enemata, particularly the so-called high enema. The commonest sites of obstruction in the colon by tumor or inflammatory adhesion are, first, at the hepatic flexure; second, in the sigmoid; third, at the splenic flexure.

Prompt passage of the bismuth to the sigmoid flexure with obstruction indicates sigmoidoscopy or proctoscopy and, in fact, the routine employment of these direct vision examinations in cases of constipation will yield much valuable information to the physician and should be used more commonly. The prevalence of the retention of numerous particles of fæcal contents among the folds of the intestine along the rectal canal in normal cases (if there be such a thing) will give one an entirely new conception of the subjects of auto-intoxication, the value and need of frequent enemata and the urgent necessity of more thoroughness in our consideration of the entire subject of intestinal elimination, especially as to the diet and habits.

In a goodly proportion of cases of gastro-intestinal examinations, the question of the presence of cancer is an important point of investigation because 50 per cent. of all cancers occur in this tract and as 16 per cent. of all cases of cancer of the digestive tract occur primarily either in the rectum or sigmoid flexure, the importance of including a complete rectal examination in any complete gastro-intestinal examination becomes apparent.

It is to be hoped that the roentgenological method of examination will become as efficient an aid in the diagnosis of incipient gastro-intestinal cancer as it has in the diagnosis of incipient tuberculosis. The degree of confidence placed in it will depend very largely upon the skill, intelligence, experience, and equipment of those to whom these cases are submitted for examination, and whatever findings are thus obtained must be interpreted in connection with full clinical observations.

GASTRIC ULCER.*

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THIS paper deals only with simple gastric ulcer as distinguished from specific or gummatous and malignant or carcinomatous ulcer.

Simple gastric ulcer has suffered in common with many other diseases with a variety of names almost royal in profusion, of which round ulcer, peptic ulcer, perforating ulcer, and Cruveilhier's disease are examples.

Simple gastric ulcers when fairly recent, are usually round or oval in outline, funnel shaped in excavation, with more or less terraced sides, due to the narrowing effect of successively resistant layers as the greater depths are reached.

Very recent ulcers are usually of the punched out variety, with sharply cut edges; while the older ulcers are apt to assume an irregular outline. Some are serpiginous, and their former location may be traced by the scars which have formed in ineffectual attempts at healing. Some of these have been formed by the coalescing of two or more ulcers; others have acquired irregular shapes by following various lines of lessened resistance. In chronic cases, the edges may be rounded and the surrounding wall thickened.

Classified as to location strictly within the stomach,

- 36 per cent. are found along its lesser curvature;
- 30 per cent. are found on its posterior wall;
- 12 per cent. are found at the pylorus;
- 9 per cent. are found on the anterior wall;
- 6 per cent. are found at the cardia;
- 4 per cent. are found at the fundus;
- 3 per cent. are found in the greater curvature.

The majority of cases in males occur between forty and forty-five years: while in women they occur most frequently between fifteen and thirty years. They are found rarely in the newborn and sometimes in the fetus as well as in extreme old age.

Broadly speaking, simple ulcers are found wherever gastric juice flows: that is, from the cardiac orifice of the stomach to the papilla of Vater in the duodenum. They are not confined, as is the popular belief, to the cavity of the stomach, but are on the contrary found in about equal numbers in the stomach and in the duodenum.

The canal of Jönnesco or the terminal three-fourths of the pyloric end of the stomach is usually immune to ulceration.

The course and termination of gastric and duodenal ulcers vary greatly. Healing is common,

and probably usual, in cases that do not prove fatal by perforation, by hæmorrhage or by pyloric or hourglass obstruction. In cases of ulceration occurring at the pylorus in the vicinity of marked muscular reinforcements thickening and scar contraction and resultant obstruction are of great frequency. Ulceration of the anterior wall, though constituting only nine per cent. of all ulcers of the stomach, furnishes over seventy per cent. of all perforations. Of hæmorrhages arising from ulcerations, those from duodenal sources are much more protracted, recurrent and intractable than those from gastric ulcers.

Regarding the causes of gastric ulcer the literature is voluminous and the opinions are widely various. The principal systemic causes are probably anemia and chlorosis. The principal local intrinsic causes are probably those resulting from pyloric and upper intestinal obstructive factors. The postural tendencies of certain occupations, as of tailors and cobblers, may be causative through mesocolic traction and duodeno-jejunal kinks. In my experience the principal predisposing cause has been prolonged mental and nervous tension, with consequent insufficient consumption of albuminous foods. I wish to emphasize my belief that in these cases the nervous tension is caused chiefly through the consequent albuminous starvation. That slight congenital hypertrophies of the pylorus, insufficient to produce positive obstruction, may be reckoned as causative seems to be most reasonable.

The effect of external burns in producing ulcer, or at least in hastening perforation, is a well-known clinical fact; which is variously explained as due to reflex nerve influence or to liberation of certain toxins, or to the inhibition of certain protecting antibodies, in the stomach wall, according as the rationaire is a neurologist, a bacteriologist or a serum-therapist.

Hyperacidity seems to occupy the three positions of cause, of association and of consequence. That it retards normal healing is beyond question; that it originates ulceration is doubtful; that it follows ulceration is well known.

To me it seems that the causative importance of obstructive factors, either at the pylorus, or at the duodeno-jejunal junction has been too generally overlooked. Traction on the mesocolon might easily narrow the foramen of emergence of the small intestine; and kinks at the duodeno-jejunal flexure are a recognized cause of fecal retardation.

Reverse peristalses due to chronic appendiceal or adhesive band irritation may bring virulent colon bacilli into otherwise sterile areas. This was shown in one of my cases in which the momentary contact of a suture which had passed through the coats of the duodenum caused a pure culture growth of colon bacilli in the subcutaneous fat of the patient, a day of vomiting having preceded the operation.

* Read before the Seventh District Branch of the Medical Society of the State of New York, at Rochester, October 19, 1911.

Gastric ulcer may cause systemic injury by exciting pain, gastric irritability, loss of appetite, fear of food, and consequent starvation. More serious are cicatricial contracture and obstruction of the pylorus; alarming or fatal hæmorrhage and perforation; the last causing a high mortality through resultant general peritonitis or subphrenic abscess.

With the first of these three classes of systemic mischief, namely stomach pain, gastric irritability and consequent semi-starvation, every physician of extensive office practice has a large, —though I fear too often,—unwitting experience. These patients present a great variety of symptoms; though sometimes as regards the stomach there is total lack of symptoms: yet some gastric distress or irritability is the rule.

The pain is to a great extent periodical (irregularly so) with variously accentuated exacerbations and remissions.

As a rule, the pain of pyloric and duodenal ulcer is relieved by ingestion of food; while that of purely gastric ulcer is much aggravated by eating.

A pretty constant symptom is the intolerance of the stomach for gas;—a feeling of fullness of the stomach with absence of gaseous distension. Under conditions of rest and frequent feeding these patients usually improve, especially if prevented from taking cathartics.

A large number of our cases of so-called dyspepsia, which have recovered their health while enjoying the conviviality of a voyage, or of a seaside or mountain sojourn, to the neglect of our dietetic strictures: or, worse still, have lost their ailments under the interdiction of cathartics enforced by the brooding wings of Christian Science, or the mauling arms of osteopathy, were cases of starvation fostered gastric or duodenal ulcer.

The protecting influences of albuminous diet are always the same whether imbibed together with the consolations of religion or in consequence of healthful exercise or of congenial surroundings. We must not allow our learned neurologist friend's fears of a proteid diet to persuade us that it was the Nubian lion and not the baby elephant that recently died of gastric ulcer in the New York zoo; nor that a corn fed turkey is stronger or wiser than a turkey fed fox!

The varying elements of location, of systemic or local cause, of extrinsic or of intrinsic infections, combine to produce a series of consequences kaleidoscopic in their combinations. To portray all the varying phases of gastric ulcer would be a task almost cyclopædic, and entirely beyond the limits of this paper. Broadly speaking, the cases of gastric ulcer without hæmorrhage or perforation are cases for the liberal-dietitian; the cases of perforation are cases for the surgeon; the cases of slow or repeated hæmorrhage without

precedent dyspepsia are cases for the careful consideration, and energetic, though conservative treatment. Cases of obstinate pyloric obstruction are all surgical: cases of intermittent pyloric obstruction are tentatively dietetic and medical: cases of acute and maybe alarming hæmorrhage, not preceded by chronic dyspepsia call for rest and careful though liberal feeding. Cases of hæmorrhage with dyspeptic history call for surgical interference.

The feeling that the breadth and importance of this subject is too little appreciated, and that the possibilities of cure by proper procedure are too little known has been the stimulus that has led to the writing of this paper.

A few cases selected with a view to the illustration of some of the various phases of this subject will be recited as briefly as possible.

CASE 1.—Acute alarming hæmorrhage, not preceded by dyspeptic symptoms. Twenty-two years ago a hard working dressmaker was seized with a sudden alarming hæmatemesis. A large wash basin was filled with vomited blood, the patient falling upon the floor in a prolonged attack of syncope from which she slowly rallied. The after treatment consisted simply in largely increased alimentation with excess of albuminous elements. A considerable gain in weight resulted, and entire recovery is evidenced by twenty-two years of sound health and good strength. In this case surgical interference would have been meddlesome and probably fatal.

CASE 2.—Pyloric obstruction, the result of old ulceration at the pylorus, great gastric dilatation, thickening of gastric walls, etc. May 28, 1908, a man, aged fifty-two, six feet two inches in height, weighing 128 pounds, with a former weight of 230 pounds, giving a history of night vomiting of fifteen years duration, constant gastric distress, sour eructations, came to me at Geneva for treatment. Even water was vomited two or three hours after taking. I found extreme gastric dilatation and evidence of pyloric obstruction. The bowels were moving about every three weeks. Emaciation was extreme and countenance was haggard, though not cachectic. May 4, 1908, gastro-jejunostomy posterior. Sixteen hours later, water taken passed out of the stomach freely. Liquid foods given after forty-eight hours. Soft diet after five days; general diet, including steaks, potatoes and vegetables, after two weeks. Weight after six months 190 pounds. No dyspeptic symptoms. Bowels regular daily. Health perfect.

CASE 3.—Chronic pyloric obstruction of intermittent character, though rather constant, hæmorrhage first fifteen years ago, protracted and alarming, death expected daily, gradual rally. Hæmorrhage two or three years later, also severe. Never able to take fruits or vegetables without distress and soreness of the stomach.

April 30, 1911, sudden severe gastric hæmorrhage, bloody stools, faintness and vomiting. Bleeding about every second day for ten days. Great prostration, pallor, hiccough, and at last continual vomiting of blood stained fluid. Operation set for Thursday morning, May 9, 1911, but postponed until afternoon on account of an attack of bleeding, leaving patient almost pulseless and extremely prostrated. Gave small amount of morphia and atropia hypodermatically to quiet stomach, which was successful. Operation at 4 P. M. Found bleeding vessel denuded by ulceration just below the pylorus in the duodenum. Some old scar tissue adjacent showing former attempts at healing. Excised diseased pylorus and performed gastro-jejunosomy posterior. Patient's condition better on leaving table than at the beginning of the operation. Several days of gastric irritability followed but rapid gain in strength ensued. Patient is now strong, well and able to take all kinds of food, including fruits, with relish and impunity.

Another patient operated on the day before the above has practically duplicated this history, the hæmorrhage, etc., being of almost parallel frequency and severity.

A case illustrating the importance of moderation in eating after relief of pyloric obstruction from cicatricial tissue by gastro-jejunosomy occurred in my practice about one year ago. A man, fifty-two, weight 113 $\frac{3}{4}$ pounds, former weight 190 pounds, dyspepsia many years, vomiting occasional for ten years, gradual loss of strength, vomiting two or three hours after taking food for past three years, bowels moving but once in two or three weeks, gastric dilatation, but no cachexia.

Posterior gastro-jejunosomy, October 5, 1910. Water in sixteen hours; liquids in forty-eight hours; soft diet after five days; general diet (limited) after two weeks. Gain in weight and strength rapid. Patient conceived a sort of pride in using the new stomach and failed to listen to warnings as to over eating. Puffing of extremities and face supervened and albuminuria and cardiac dilatation set in after an attack of grip due to exposure. Patient died suddenly on the train from cardiac paralysis or thrombosis some six months after the operation. Here the too rapid filling of the blood vessels caused blood pressure rise and cardiac and renal consequences. This tendency to slight heart block is one that I have observed in several cases after gastro-jejunosomy for pyloric obstruction and calls for moderation in eating until the blood vessels have become accustomed to the increased fullness which comes of liberal feeding. No consideration of the subject of gastric ulcer can be considered complete which fails to deal with the tendency of these lesions, when not promptly healed, to undergo epithelial ingrafting or carcinomatous de-

generation. Nowhere in the body are the conditions more conducive to such a result. The presence of a highly specialized type of epithelium possessing remarkable powers of constant exfoliation and regeneration; the close proximity of tissues muscular and connective of mesoblastic origin subjected to the unwonted depressive action of corrosive digestive fluids and of mechanical irritation: the mechanically inclusive action of the rugæ accentuated by aggravated muscular irritability, are all elements which make ingrafting of epithelial cells in connective tissue spaces of imminent incidence.

The wonder is not that sixty per cent. of all carcinomas of the stomach are of ulcer origin; but that all ulcers of chronic type do not undergo cancerous degeneration. Observations on lower forms of life show that cancers are more prevalent in them than in the more perfect races of animals. It is therefore probable that through long ages of natural selection our race has acquired a cell resistance to heterogeneous implantations which explains our relative immunity.

The effect of a properly performed gastro-jejunosomy in hastening the healing of gastric ulcers is one of the most satisfactory facts that we encounter in the whole range of surgical work. In this connection, however, it is necessary to make a careful survey of our environments and of the possibilities. Given a simple ulcer of recent formation with typical outlines and classical section, unmarred by excessive thickening or undermining of the edges, we can safely trust to the innate regenerative powers of the tissues to complete the healing after a gastro-jejunosomy.

On the contrary, the presence of any considerable amount of connective tissue thickening with consequent lessening of connective tissue blood supply, and therefore of resistance to epithelial invasion demands the adoption of the more radical proceeding of complete excision of all parts of the ulcer, accompanied by efficient stomach drainage by gastro-jejunosomy.

Cancer never forms in the cicatrix of first intention, and in these cases we have never performed our full obligation to our patient until we have replaced the ulcer with a healthy well-nourished scar.

To the patient who has been freed from the melancholy incubus of an obstructed pylorus, the newly regained bounties of earth dwarf the perspective of the beatitudes of Heaven; and the brightening smile emanating from the well-nourished brain finds on the broadening visage ample room for depiction; therefore, if we are to contribute our full quota to the happiness of mankind we must first cull out these pyloric unfortunates from our blacklist of neurasthenic dyspeptics.

NEURASTHENIA.*

A CLINICIAN'S IMPRESSIONS.

By H. G. WEBSTER, M.D.,

BROOKLYN, NEW YORK.

I MUST beg of you to bear with me if in the very general and fragmentary considerations I present for your consideration there is little that is original and much that has been gone over by others better able than I to speak on a subject that properly belongs to the nervous system. But neurasthenics of all types make up so large a part of every day practice and their care is so largely in the hands of the general practitioner that he is familiar with at least the clinical appearance of these cases, however little he may know about their neurological niceties.

By neurasthenia I apprehend to be meant those cases of nerve exhaustion that cannot be traced to a cause situate in some definite organic lesion of the nerve centers. Like many definitions this is but another way of grouping clinical syndromes of obscure origin and dignifying them by the name of a disease. In practice it is bad, for it tends to promote a slipshod method of diagnosis, chokes off careful analysis and leads to routine in treatment, which often results in failure.

I am led to this remark by the observation that similar conditions surrounding one group of subjects result in nervous breakdown while they produce little or no harmful effects on another group, and, conversely, certain patients rapidly develop nervous exhaustion from causes that seem utterly inadequate. Or, stated more concretely, quiet and monotony in one individual produce similar results to stress and excitement in another.

Argued from this viewpoint, there must be certain definite, if subtle, causes at work that require to be studied in their relation to the individual; causes that always tend to similar effects modified by the character and physical makeup of the patient. If we are to accept the notion that excitement is meat for one and poison for another, we should quickly run into an entanglement of contradiction that would befog both diagnosis and treatment.

Clinical experience shows at least three general classes of neurasthenics. Of these the most common is the thin, poorly developed type. Here some hereditary trait may usually be elicited. The patient may be one of several in the same generation who exhibit the same underdeveloped physical and nervous makeup, bespeaking depleted vital energy in the parents and the tendency to early senility in the offspring. But in such a family the neurasthenic symptoms may develop in only one or two, and those the least exposed to influence likely to precipitate a nervous breakdown. One sister may successfully withstand repeated childbearing, the annoyances

and worries of housekeeping, financial stress and sorrow, while another much more fortunately placed will develop neurasthenia. Careful analysis of such a case may eliminate such causes as faulty sexual life, anatomical abnormalities, previous severe illness and the like and leave only the minor ailments, among which constipation, frequent digestive disturbances and bad hygiene are regularly to be found. Usually some monotony in domestic or business life is also present. Other things being equal, and all due allowance being made for poor resisting powers, why should the more favored one be the neurasthenic? Grant that monotony depletes the nervous force and that lack of occupation promotes morbid introspection, allow for the variations that are recognized accompaniments of primogeniture and parental decadence and one must still seek a physical factor that is at work in the one and not in the other. I am convinced from the frequency with which gastro-intestinal disturbances accompany neurasthenia in such patients that absorption of toxins due to faulty metabolism promoted by a poor physique and acting upon a nervous system that is the legacy of unhealthy parentage is more likely a cause than a result, and that an indolent, sequestered or pampered mode of life fosters the growth of toxins that are the probable source of nerve weakness. Women of this type being more prone to constipation, develop neurasthenia more readily than men.

A second general type includes the fat, well nourished cases—women of 40 or thereabouts without children, well-to-do, and by no means appropriate subjects for nerves. It has been the writer's fortune to have to deal with several women of this sort, in all of whom the question arose whether their nervous symptoms were not due as much to innate cussedness as to disease, for they all had too much leisure and too little responsibility to provide occupation for mind and body. Prominent symptoms common to all the cases included headache, insomnia, digestive and vaso-motor disturbances. Pelvic symptoms could be excluded in almost every case. Two have developed appendicitis, mild and chronic in one, fulminating in the other. One case in particular is worthy of more detailed mention. For more than ten years, during which her worldly estate has prospered rapidly, she has quarreled with her husband until two years ago they separated. During this entire period she has complained of almost constant headache, insomnia, which has led to the bromo-caffein habit, choking sensations, frequent attacks of weakness and prostration, paræsthesias, vomiting after meals and a curious vaso-motor irritability that manifests itself in irregular localized erythema that flushes and fades in one region to appear in another while one watches it. In spite of all these handicaps she has increased steadily in weight. On frequent occasions, after prolonged periods of insomnia, enormous doses of a variety of drugs

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have failed to produce sleep, while in the intervals she sleeps quietly without artificial help. Often the intense headaches refuse to respond to medication. There is probably a certain degree of hysteria underlying this patient's condition, but there is also a gastro-enteric factor that does not yield to treatment and which is, I believe, an important one in the causation of her neurasthenic state. She has recently complained, however, of pain in the right lower quadrant of the abdomen, and it is interesting to note that since writing the above some months ago, a well marked, rapidly growing fibroid change has developed in the uterus, showing that her internal genitalia play some part in the causation of her neurasthenic symptoms. It will be interesting to observe what changes a hysterectomy may produce in her condition.

A third general class includes young business women ranging from 17 to 30, or thereabout. In these the variation of symptoms is considerable. In one rapid loss of weight pointed to a possible tubercular involvement of the lungs, which, however, did not develop. In another persistent headache was the prominent symptom. In a third insomnia, made worse by the usual hypnotics, but gradually relieved by tonic treatment, was the distressing symptom. In two others intense backache in the scapular region was the chief complaint. In all irritability of temper, fatigue coming on after trifling exertion, and gastro-enteric symptoms were regularly present. It would seem that the monotony of office routine, the necessity of performing the daily quota of work, the annoyance of transportation difficulties, in some instances intensified by menstrual discomfort, are constant factors which tend to exhaust the nervous reserve of young women in business. Natural modesty, that deters sensitive women from paying strict attention to regular evacuation of the bowels, during business hours, probably contributes its share. As well marked anemia was only occasionally noted, it probably is a minor cause, though one that must not be overlooked. It is also probable that unsatisfied, if unconscious, sexual cravings are of some moment as a subconscious factor in promoting nervous irritability.

Many of the above causes undoubtedly act to make school teachers decidedly prone to nerve strain. Add to these the constant annoyances of the class room, the hopes and fears attendant on the nurture of budding ideas, and the added distractions enforced by the present complex, irrational and cumbersome school system that has to do with matters not of education, but of administrative detail with which a teacher should not be burdened, and it is no matter of wonder that one dreads to see a school teacher enter the office. With them, too, improper diet has much to do with promoting intestinal troubles. The hurried breakfast, inadequate and poorly selected lunch and often excessive evening meal, sooner or later bring about intestinal putrefaction, es-

pecially when coupled, as is often the case, with extra study to secure promotion, particularly if little exercise is taken.

Beside these approximate classifications there is a generous number of patients who cannot be grouped either by occupation or physical characteristics. A recent case admitted to the women's ward at the Methodist Hospital is instructive. She was a woman of 48, assigned to the medical service with a tentative diagnosis of neurasthenia. She complained of a variety of nervous disturbances, was flabby and anemic and had a good deal of indefinite abdominal distress. Examination of the abdomen showed a relaxed condition of the parietes through which it was easy to make out a general ptosis of all the viscera with a moderate splenic enlargement and some indefinite tenderness, insufficient to explain the pains of which she complained. Examination of the blood showed an infection by a double tertian malarial parasite and the stools contained the ova of *ankylostoma duodenale*. Quinine and thymol speedily cured her neurasthenia. In another instance marked neurasthenic symptoms in a Brooklyn physician promptly disappeared after the expulsion of several round worms.

The writer appreciates that he has here presented a very incomplete and generalized series of cases; it includes only one in which the element of pelvic disease is prominent and none of the so-called traumatic variety. In regard to the latter cases, the few that have come under my notice have been medico-legal cases and in the writer's mind are always open to the suspicion that self-interest and other purely psychic elements are responsible for the symptoms as well as for the remarkable cures that follow a favorable verdict. One case that presents decided neurasthenic symptoms has been under observation now for some months.

A young woman, domestic servant, fell down stairs and claims to have received some injury to her spine. Some years ago she was treated for an ulcer of the stomach, with manifest improvement. A return of all her stomach symptoms accompanied the fall. In this instance as she harbors no resentment, and attributes the injury to personal carelessness, it is fair to believe that traumatism plays a large part in causing her symptoms, but here also it is worthy of note that she has been a sufferer from profound gastro-intestinal symptoms for a long period.

Superficial analysis of the observations already reported emphasizes at once the prominence of the intestinal symptoms from first to last. One need not go so far as to search for a single form of intestinal trouble because intestinal absorption from a variety of causes may and does produce similar results.

A recent writer reporting a considerable number of cases, seems to favor the idea that chronic constipation is the basis from which these all have sprung, and by inference, that constipation is the principal cause of neurasthenia. It would

be needless to attempt to reduce all cases to one particular form of intestinal disturbance, for the process of digestion includes a complex series of chemical changes that produce, when incomplete, a variety of organic compounds which seem to vary in toxic properties in individual cases.

Faulty metabolism manifests itself in one victim through disturbances of the liver and its functions; in others, the skin, the joints, or the muscles suffer. In still others it is the nervous system that gives way under the accumulation of toxic products. In one patient there is the frank evidence to be obtained by examination of the urine, and in others such evidences are entirely lacking. Angell, writing in the *New York State Medical Journal* for May, 1911, calls attention to the excess of nitrogen excreted in the urine of nervous patients, an observation I have frequently verified.

In addition it is by no means uncommon to observe calcium oxalate crystals, sometimes with, but more often without a faint trace of albumin. Marked oxaluria may occasionally be accompanied by cylindroids and even hyaline casts. This condition is more apt to be pronounced in cases of well advanced neurasthenia, and in the writer's estimation indicates an excessive degree of intestinal insufficiency that causes the nervous symptoms. It is also well to bear in mind that albumin and casts in such cases do not indicate nephritis and are merely indicative of an irritation of the kidney that promptly subsides with the removal of the cause.

Emphasis has been laid on the presence and amount of indican in the urine and very careful observers have endeavored to gauge the degree of intoxication by the amount of indican present. Personal observations extending over several years seem to indicate that little reliance may be placed upon indican as a positive index. Its variations in the same individual are sometimes spontaneous, sometimes seem to result from treatment, but fully as often are contradictory and disappointing. Nevertheless, the presence of indican and other aromatic compounds should be carefully watched for, even if untrustworthy as a positive index.

In a certain number of patients with chronic intestinal disturbances, there seems to be a sufficient regularity in the bowel evacuations, and yet further analysis indicates in them conditions quite similar to others who are suffering from a positive intestinal stasis. Obvious constipation is therefore not a sufficient cause of neurasthenia by itself. There must be some other factor resulting from intestinal stasis. One class of patients with nervous symptoms tracable to intestinal conditions may be hearty eaters, another may be very careful and abstinent; they suffer equally from intestinal disturbances. Reasons such as these, capable of and demanding very much fuller consideration and analysis than I have felt privileged to draw from the some-

what imperfect records that I have been able to keep, make me feel that while it is unwise to limit one's conclusion that neurasthenia is always the purely symptomatic expression of a definite internal kakobolic disturbance, nevertheless, so many cases present evidences of faulty intestinal conditions, and so many are rapidly relieved of nervous symptoms by the correction of recognized faulty intestinal conditions, that it is proper to record intestinal disturbance as at least a probably positive factor, even if it may not be a universal cause. The variety of intestinal disturbances, including intestinal parasites, that have fallen under the writer's notice, is distinctly suggestive that any form of intestinal irritation may lead to nervous manifestations.

Given a single constant irritant in a person whose reserve of nervous energy has been depleted and nervous symptoms will develop. It seems reasonable that a positive organic poison, such as we know to result from faulty nutrition or from intestinal putrefaction, will exert a positive destructive force upon the nerve cell such as cannot be exerted by any external irritant such as worry or purely mental distress, and when this is coupled with improper nourishment and fatigue, we have a combination which offers a rational explanation of nervous breakdowns such as cannot be drawn from causes which are extraneous only.

THE OCULAR HYPERAEMIAS.*

By HOMER E. SMITH, M.D.,

NORWICH, N. Y.

IT is an easy matter for one to present a technical subject with which he is thoroughly familiar to a jury of experts; nothing is more difficult than such a presentation to a general audience. When a specialist is invited by your president to write upon some topic relative to the eye he must steer between the Scylla of presumptuous pedagogy and the Charybdis of self-exploitation. In the first instance he never can tell how much his audience knows or how little he knows himself, and in the second his highly technical dissertation falls on wearied and unheeding ears, fails in its purpose and is wasted on the desert air. I was moved to choose this subject, first, because an erroneous diagnosis is so often made in the external inflammatory diseases of the eye, and next because of this error the treatment applied is so often fatal to vision. In an expert such an error is inexcusable, but many of these cases go first to the family physician and he should be so trained as to be able to distinguish between them. Whether he should

* Read before the Sixth District Branch of the Medical Society of the State of New York, at Elmira, October 17, 1911.

treat them is largely governed by circumstances, but if possible, except in the cases of catarrhal conjunctivitis, it is my opinion they should be transferred to an oculist. It is not so very difficult to determine the nature of a given inflammatory case, but it needs an eye trained to detect certain characteristics which belong to the different diseases. To do this requires that one should know the source and distribution of the blood supply to the anterior half of the globe and that he should distinguish which of these systems is the seat of the congestion which is manifest in the redness of the inflamed eye.

The blood supply of the globe is derived from the ophthalmic artery and those branches which are distributed to its anterior part are the long posterior ciliary and the anterior ciliary arteries. The former, two in number, pierce the posterior part of the sclerotic at some little distance from the optic nerve, run forward along each side of the eye ball between the sclerotic and the choroid to the ciliary muscle where they divide into two branches; these form an arterial circle, the *circulus major*, around the circumference of the iris and from which numerous radiating branches pass forward in its substance to its free margin where they form a second arterial circle, the *circulus minor*. The anterior ciliary arteries, six or eight in number, are derived from the muscular branches, they pass along the tendons of the recti muscles, reach the sclera and pass along this to the corneal margin. Branches are given off which pass backward to supply the anterior half of the sclera. Two branches are given off which pass forward to the bulbar conjunctiva and these anastomose with the branches from the palpebral arteries. There are eight or more branches also of the long anterior ciliary which perforate the sclera about 6mm. from its junction with the cornea and assist in making up the *circulus iridis major*. Thus while the vascular supply is from its main stem, the ophthalmic artery, yet is it divisible into two systems each for the conjunctiva and the iris and one for the sclera. The centre of the cornea in the healthy adult eye has no bloodvessels, but there is a vascular zone about 1.5 mm. broad at the periphery formed by anastomotic loops from the superficial conjunctival arteries. This brief description of the vascular supply of the anterior portion of the globe shows how intimately are associated all these systems and while the nature of the congestion is an important guide to the diagnosis of an inflammatory condition in this region, yet other symptoms have equal or greater value and must be given proper consideration. Also is it true that only in their incipiency does the nature and site of the congestion take on primary diagnostic importance for in advanced and severe inflammatory affections all the vascular systems are engorged and the eye uniformly red. There are four structures, the conjunctiva, iris, cornea and sclera, whose inflammations

will be compared and two conditions, glaucoma and trauma, which lead to congestions simulating inflammation which latter may or may not be an associating factor in the case. The two most fatal errors which the inexpert make in treating the ocular hyperaemias are in mistaking an iritis for a conjunctivitis and withholding atropin or failing to see the difference between an iritis and glaucoma and in using it. The first mistake will damage vision, the latter ruin it, and both are inexcusable. Let us compare the differences in the hyperaemias which usher in the various forms of inflammatory conditions of the anterior half of the eye. In conjunctivitis the deepest congestion is on the lids and shades to a lighter tint as the cornea is approached and this congestion is superficial. In iritis the redness is most marked at the sclero-corneal junction, shading off as it reaches out toward the lids, is deep seated and of a finer uniform pinkish tint. It is easy to distinguish between these two and a simple procedure will make it still easier. If the lower lid be pressed with the fingers against the globe a conjunctival congestion will, for the moment, be wiped out, but one of the iris will show as an injection around the cornea. A keratitis, when it has reached that stage when congestion is evident—I am now speaking of deep-seated keratitides—will show discrete enlargement of the superficial conjunctival vessels and a deep purplish zone around the cornea much darker than in iritis. If the keratitis be superficial there will be greater ocular congestion and if ulcerative there will point toward the site of the ulcer the apex of a sector of marked superficial conjunctival injection. In scleritis the hyperaemia is localized over the site of the inflammation, is of a bluish red tint and running into it are the enlarged conjunctival vessels. In subacute glaucoma the perforating branches of the long anterior ciliary arteries are first involved and there will be seen engorged deep-seated tortuous vessels which disappear about 6 mm. from the sclero corneal margin. In trauma, and this includes foreign bodies, the location and amount of the inflammation are most serviceable aids; the conjunctiva near the foreign body or wound is most congested and this is true of the conjunctiva near a corneal wound. If the cornea or the bulbar conjunctiva is the seat of a foreign body the injection is usually superficial and limited to the conjunctival vessels, but if there be a penetrating wound, involving the deeper structures, the sub-conjunctival and scleral vessels are more prominent.

The foregoing presents the different types of ocular congestion and these give, as has been said, important clues to the diagnosis but also must be taken into consideration, pain, secretion, lachrimation photophobia and vision. Also must be observed the condition of the pupil, its size, contour and responsiveness to light in comparison with its fellow eye. The iris must be closely

examined and any change in color or lustre noted. The cornea may lose in transparency by disease, its surface may be irregular with no loss of substance or there may be the latter in larger or smaller areas and these may vary greatly in depth. A routine examination should proceed as follows: First, note the nature of the redness and determine which of the vascular systems is involved; next secretion—in only one disease is this present, catarrhal conjunctivitis, or in trauma where infection has followed. Next, vision. This is impaired in iritis, keratitis and glaucoma. In scleritis it is not affected. It may or may not be in trauma, this depending on the site or the severity of the lesion. It may be in conjunctivitis also, but this is dependant solely upon a tenacious secretion on the cornea and vision comes up when the lids are moved over the globe to remove it. Pain is present in all diseases except in conjunctivitis; here is irritation only as of some foreign body in the eye. It is least in keratitis where no ulceration occurs, but marked if there be loss of corneal epithelium. It is severe in iritis, deep-seated and burning in scleritis, agonizing in acute glaucoma, and any inflammatory disease accompanied by pain should at once have the services of one trained in these diseases. If there be marked intolerance of light it is safe to infer the existence of loss of corneal substance, if it be mild it is probably iritis. Lachrymation has no diagnostic importance as it is more or less present in all congestive states of the anterior half of the globe. When the history has been taken and the before-mentioned symptoms given their proper place and value one may proceed with the physical examination of the eye.

With the patient in a darkened room, focus the light from any good source of illumination by a condensing lens upon the eye and note the polish, contour and transparency of the cornea; bring to aid in this examination a corneal loupe. If there be any doubt as to the integrity of the corneal epithelium, instil into the eye a drop or two of an alkaline one per cent. solution of fluorescein. This will make any abrasion, foreign bodies or loss of substance very evident by the green stain which it leaves wherever the outer layer of the cornea is broken. By focal and oblique illumination any loss of transparency, either local or general, of the cornea shows either as whitish spots, clouds or diffuse opacification. A normal pupil will contract under this illumination and dilate when the light is removed, not so in glaucoma or iritis. Here the pupil is practically immobile—dilated in the first; contracted in the second instance. If the color of the irides be compared it will be noted perhaps in the inflamed eye that it is darker in hue and somewhat lacking in lustre, if this be the case and the pupil be small test it with a one per cent. solution of homotropin; no harm is done even if the case be conjunctivitis, for then you make

your differentiation exact. A fully dilatible pupil is incompatible with an iritic inflammation.

In conclusion, it is the confusion between iritis and conjunctivitis and between iritis and glaucoma that causes such fatal mistakes in treatment. It is a safe rule if you have a red eye and a small pupil use homotropine as a diagnostic agent. If you have iritis you will get an irregular or non-dilatible pupil. If it dilates fully and rapidly it is conjunctivitis. In any event, you have done no harm and possibly much good. The effect of the drug will wear off in a day or two or, if you must relieve the slight discomfort it causes, a drop of weak eserine solution will do it. If you have a red eye and a large pupil see if the perforating vessels are enlarged and tortuous. The color of the iris is unchanged, but it is seen through a cornea which is steamy. Note well this point and the dilated iris. A muddy aqueous may give in iritis, to some degree, a somewhat similar appearance, but the cornea is clear and the pupil small. Note the fine circumcorneal injection which goes with this condition. In iritis the corneal reflex will be bright and regular, but in glaucoma it is dim and the cornea is seen to have lost its transparency. In keratitis you will have a steamy cornea also, but the pupil is *small*.

One last word, even at the risk of repetition: first note the type of congestion, next the size of the pupil, last the transparency or lack of it of the cornea. Bearing these in mind you will not go astray. To many of you this paper may seem superfluous and supererogatory. That it is not so, witness the many ruined eyes which too often and too late come to the oculist to remedy that which is irremediable.

THE DIAGNOSIS OF SYPHILIS.*

By W. W. QUINTON, M.D.,

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THE syphilitic virus is introduced into the system by inoculation, usually as a result of impure sexual intercourse and occasionally by accidental contamination.

At the point of inoculation, after a period of incubation varying from ten days to six weeks, appears the initial lesion or chancre.

This lesion lies in the plane of the skin. It may present the appearance of a scaly, slightly flattened papule, with an abraded surface and an area of infiltration; or it may assume the aspect of a crateriform ulcer; or occasionally we may encounter a type where the surface is abraded and covered with a tenaceous pseudo-membranous film or exudation.

The favorite sites in the male are the glands,

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prepuce or shaft of the penis; in the female, the labia, clitoris, just within the vaginal orifice or higher up.

The extragenital chancre may be found on any part of the body, usually on the lips, tongue, tonsil or finger.

During the ensuing few weeks occurs the "so-called" secondary period of incubation during which time a progressive involvement, of the lymphatic structures takes place, starting with those nearest the point of inoculation. When the chancre is on the penis the lymphatics of that organ can be felt rolling under the examining fingers like whipcord. The glands are smaller or larger, spindle-shaped, non-adherent, painless and as a rule show no suppurative tendency.

The eruption appears, occasionally in six weeks, usually in eight and sometimes after a longer period. Preceding it certain general symptoms are to be noted, viz: headache, bone-ache, sore throat, loss of weight, falling of the hair, mucus patches, febrile action, lassitude and occasionally cachexia and iritis.

These various manifestations unite in forming a picture of the disease which is unmistakable and the diagnosis is easily made. The diagnosis in the female is not so readily arrived at. The chancre may pass unnoticed; the eruption may be so slight as not to attract the patient's attention and in so many cases even among the better classes the first lesions complained of are those of the third stage.

The character of the eruption varies for syphilis is a great imitator and there is scarcely an eruption (leaving out some of the exanthemata) which cannot be simulated and at times strikingly so by this disease.

It is not my intention to take up your time with a description of the various aspects which an eruption of this nature may assume. The arrangement is usually general and symmetrical; it may on the other hand show a special predilection for certain regions; it may be scanty or abundant and vary considerably in its duration.

In the earlier eruptions there is little tendency toward grouping; in the later secondary, relapsing cases, irregular grouping occurs with occasional segmented or circinate tendency. In tertiary eruptions segmented, serpiginous and circinate formation is common.

The color is characteristic, dull coppery red, brighter in the earlier eruptions but eventually becoming darker as the disease progresses and tending to assume a brownish pigmentation.

The eruption may be polymorphous; usually it is more or less uniform. It may be macular, papular, pustular, vesicular, bullous, tubercular or gummatous.

The ulcers of the early pustular stage are superficial and have no special characteristics; in the later stages we find circinate, segmental or kidney-shaped ulcers. The segmental, horse-shoe scars resulting from these ulcers are very characteristic; they are relatively soft and give

little idea of the extent of the previous ulceration.

In hereditary syphilis we find the child thin, sallow, shriveled, with an eruption usually polymorphous, with mucus patches, snuffles, sometimes dactylitis, onychia, keratitis, exostoses, etc. We must not expect all these symptoms in a given case but two or more of them will always be present and the diagnosis is not difficult.

The importance of being able to properly diagnose syphilis from a study of its clinical manifestations must be apparent to all. We may then confirm our diagnoses by laboratory methods.

What are the factors which we must consider in this regard?

1. The presence of the *Treponema Pallidum*.

It is stated that this organism can be demonstrated in the lesions of all cases during the primary and secondary stages. It is found in the scrapings of chancres, incised papules and condylomata; smears from mucus patches and in the spirated fluid of the infected glands.

Schaudinn and Hoffman have also demonstrated it in the blood obtained by splenic puncture on the day preceding the appearance of the eruption. Levoditi found it in *Pemphigus Syphiliticus*.

It has been found in the internal organs of children who had died of syphilis and Metchnikoff demonstrated it in the lesions of artificial syphilis in the ape.

Relative to the possibility of detecting the spirocheta in syphilitic lesions and the attendant difficulty, reference is made to the figures given by Thibierge, Ravaut and LeLourd.

The *Treponema* was found by them in 17 out of 19 cases of chancre; 8 out of 11 cases with mucus patches; 7 out of 9 other secondary cases and in only 3 out of 13 cases of examination of the fluid drawn from syphilitic glands.

When the organism cannot be found in the scrapings of syphilitic lesions we may fall back upon animal experimentation. The *Macacus* monkey or a chimpanzee may be inoculated, as they are susceptible to syphilitic infection, and the reinoculation from the first to a second and a third generation is possible. Even in the last animal, numerous spirochetæ will be found.

Noguchi has inoculated the testicular tissue of rabbits with human syphilitic material and from this has grown the *Treponema* in virulent form.

The *Treponema Pallidum* is a very delicate structure with low refractive power. It takes aniline dyes with difficulty. The larger organisms present 10-40 deep incurvations; the smaller 2-4. Their length varies from 4-10 microns, with 7 as an average; the width does not exceed 0.5 micron.

Its movements are winding, bending and whipping. It has a flagellum at each end. It is best seen by dark field illumination. In the absence of a suitable apparatus the same effect may be obtained by mixing a drop of serum with a drop of sterile India ink, the so-called Burns Tusch process. The examination is then made either

directly in a wet state, with a cover glass over the specimen, or spread out like a blood smear with a drop of immersion oil on the dried specimen.

If desired the organism may be stained by the Giemsa or the Goldhorn method.

Goldhorn's stain is very satisfactory. The technique is as follows:

1. Fix in absolute methylic alcohol 15 seconds.
2. Wash in running water.
3. Place in 1% eosin for 30 seconds.
4. Wash.
5. Place in Goldhorn's polychrome methylene blue one minute.
6. Wash and dry in air.

The organism appears a violet color which may be changed to bluish black by treating the specimen with Gram's solution for 15-20 seconds.

2. The Wassermann complement fixation test.

This reaction is rarely met with outside of syphilitic cases. Some cases of cancer will give a partial fixation. Some observers have reported a certain degree of fixation in 40-50% of scarlatinal cases. A positive reaction has been described in yaws, lepra and sleeping sickness. These results do not detract from the value of the reaction in syphilis. It appears certain that 90% of known syphilitic cases react to it and somewhat more than 50% of the latent cases.

The results may be formulated as follows:

Primary cases	.....78%	positive
Secondary cases	.....90%	"
Tertiary (active)	.....85%	"
Congenital	.....94%	"
Cerebro-spinal	.....81%	"
Tabes	.....61%	"
Paresis	.....98%	"
Latent	.....53%	"

The percentages of different observers vary somewhat. For instance, Boas obtains only 73% of positive results in primary syphilis while in secondary he reports 97%, tertiary, 95%, and again in latent syphilis only 37%.

The effect of antisyphilitic treatment on the reaction is very beautifully demonstrated by his experiments.

In secondary syphilis:		+	-
Cases entirely untreated	.....	269	0
Relapse cases treated at outset	..	187	12
Tertiary syphilis:			
Entirely untreated or treated only during the secondary period	.....	63	0
Treated as tertiary syphilis	.....	16	4
Early latent syphilis:			
Entirely untreated	.....	11	0
Treated	.....	89	154
Late latent syphilis:			
Entirely untreated	.....	4	0
Badly treated	.....	33	11
Well treated	.....	11	56
Tabes:			
Untreated as tabes	.....	17	0
Treated as tabes	.....	11	15

It will be seen from these figures that 100% of positive reactions obtain in untreated cases. Therefore, when antisyphilitic treatment can be excluded, a negative result in a doubtful case will make a diagnosis of syphilis highly improbable.

This test should be employed in all cases but it is essentially a laboratory measure and requires long practice and the most perfect technique to secure reliable results.

3. The degree of anemia obtaining in the secondary stage, all things being equal, may be regarded as a fair index of the severity of the infection. Examination of a blood specimen will reveal a moderate leucocytosis; the lymphocytes are increased while the neutrophils are relatively diminished.

4. Justus' blood test.

Justus observed that a marked and rapid diminution of the hemoglobin (10-20%) occurred in cases of florid syphilis when a large amount of mercury is introduced at one time into the body of the infected individual. At least 3 grams of blue ointment should be employed for an adult—1 gram for a child. The fall in the hemoglobin content can be demonstrated in 70-80% of the cases in 24 hours. As the symptoms involute the reaction disappears to return with the relapses. It does not occur in healthy individuals.

5. In the cerebro-spinal fluid a marked lymphocytosis is found, but unfortunately the same condition exists in tuberculosis.

6. Noguchi's butyric acid test.

This depends on the increase of the globulin content in the cerebro-spinal fluid.

The test is performed in the following manner:

To the cerebro-spinal fluid is added 0.5 c.c. of a 10% solution of butyric acid. This is boiled and 0.1 c.c. of normal sodium hydrate is added. The mixture is again boiled and a white flocculent precipitate appearing indicates a positive result.

If the amount of protein is large the precipitate will appear in a few minutes; if small a delay in its formation occurs. Two hours are given as the extreme time limit for the test.

Noguchi has made an interesting comparative study of the Wassermann reaction, the butyric acid test and the cytological formula as applied to the cerebro-spinal fluid.

	Was. Reac.	Buty. Acid.	Cyto. Form.
In secondary and tertiary cases:	negative	feeble	negative
Hereditary syphilis	.....80%	90%	....
Cerebro-spinal	.....50%	100%	positive
General paresis	.....73%	90%	91%
Tabes	.....52%	100%	100%

In tuberculous cases search must be made for the bacillus and the Wassermann test applied to both the spinal fluid and the blood serum.

These are in brief, the means by which we make our diagnoses in syphilis. Formerly few of

us had the courage to place our patients on anti-syphilitic treatment during the primary stage. At the present time with our perfected laboratory methods, we may do so with impunity in many cases, greatly to the benefit of the patients and to the great credit of the medical profession.

COMBINED VACCINES IN THE TREATMENT OF GYNECOLOGICAL INFECTIONS.

By WILLIAM STONE, M.D.,

and

T. L. HEIN, M.D.,

NEW YORK CITY.

NUMEROUS changes have taken place during the past few years in the treatment of all forms of infection. It is within the memory of many practicing physicians that "laudable pus" was eagerly anticipated in the treatment of wounds. An absence of this pus usually was interpreted to mean an unfavorable prognosis. Its presence no doubt indicated that nature was endeavoring to overcome the invading bacteria by means of her protective forces, leucocytes and lymph. Though much destruction had taken place it undoubtedly was an evidence of active phagocytosis.

With the advent of antiseptics an endeavor was made to destroy the bacteria by means of topical applications of some of the usual chemical antiseptics. The results produced were frequently more harmful than beneficial, as they did not reach the point of progression in the infection, but merely attacked the discharged bacteria. Again, they also frequently hindered the free escape of waste products, such as destroyed leucocytes and lymph, and sometimes by pressure or osmotic influences aided the further dissemination of the infecting agent. At the present time we are on the threshold of an age where it is found necessary in combating infection to increase the efficiency of nature's protective forces and thereby limit the extension and curb the activity of the infecting bacteria.

In the early days of the treatment of diphtheria by means of antitoxins considerable antipathy to this treatment was produced, due to lack of knowledge of the proper method of using this marvellous therapeutic agent. With the advent of the other antitoxins and antisera, such as antitetanic, antistreptococcic and antigonococcic sera, more specific results were accomplished in a shorter space of time by their use. Since the introduction of bacterial vaccine therapy, a most valuable aid in the treatment of infections has been placed in the hands of physicians. That the use of this product has not become more general is undoubtedly due to the fact that many physicians are unfamiliar with the proper mode

of application, or in the first trial of such a product, failure has resulted, and, therefore, further trial is considered unwise. Too frequently the employment of bacterial vaccine therapy is delayed until every other treatment has been tried, and then, as a last resource, when it is too late to anticipate any benefit, the poor little germs are used. In the use of bacterial vaccines we have only an aid in the treatment of infections. It cannot be considered that an absolute specific for all conditions resulting from infections is at hand, but with the proper injection at the proper time of the correct dose of a carefully prepared vaccine we may expect in many instances marvellous changes in the condition of the infection. Under these conditions it will be found that the vaccines are devoid of all danger.

In an endeavor to describe some of the results which we have obtained from the use of these vaccines in gynecological cases only, we are calling to your attention the histories of a few cases of gynecological infection which have been successfully treated by means of special vaccines.

We are indebted to Dr. Seaborn of the Department of Experimental Medicine of Parke, Davis & Co., for supplying us with the combined vaccines (Van Cott) which were used in these cases.

CASE 1.—C. G.; aged 38 years; Russian; married 21 years; three children; youngest 18 years; all normal labors and puerperiums; all breast-fed; one miscarriage; menstrual history, negative. This woman has been suffering for the past two years of bilateral iliac pain, backache and a moderate yellowish-white vaginal discharge. Her gastro-intestinal tract was normal. She denies any venereal disease. On bimanual examination, both tubes were found to be thickened, both parametria moderately infiltrated with elicitation of pain on pressure in both tubular regions and in the posterior cul-de-sac. Diagnosis: Bilateral salpingitis; parametritis; subacute endometritis. Treatment: She was given hypodermatically combined vaccine (Van Cott) containing staphylococci polyvalent 250,000,000, streptococci polyvalent 25,000,000, and coli communis polyvalent 100,000,000. A slight reaction occurred in eight hours. At the expiration of 24 hours the pains had diminished. On April 4th double the amount was injected. On April 11th and 18th the same dose was repeated with relief of all symptoms. One month after the first injection she did not have a return of any of her symptoms.

CASE 2.—I. B.; aged 28 years; Russian; married five years; no children; no miscarriages; menstrual history, irregular, occurring every 3 to 3½ weeks; flowing two days, scanty in amount and accompanied by backache at onset. This patient complained for the past six months of left-sided iliac pain, backache and a profuse yellowish-white vaginal discharge. Her gastro-intestinal tract was costive and she denied

venereal diseases. On bimanual examination the left tube was found to be thickened, the posterior cul-de-sac was infiltrated and painful on pressure, the cervix was hypertrophied and eroded. Diagnosis: Left salpingitis; endometritis; hypertrophied and eroded cervix. Treatment: She was given hypodermatically combined vaccine containing streptococci polyvalent 25,000,000, staphylococci 250,000,000, and colon polyvalent 100,000,000. A moderate reaction occurred within 12 hours. At the expiration of 36 hours the pain and discharge had diminished. On April 4th double the amount was injected. On April 15th and 18th the same dose was repeated with relief of all symptoms.

CASE 3.—F. G.; aged 33 years; married 16 years; Russian; four children, youngest two years; all normal labors and puerperiums; all breast-fed; one miscarriage; menstrual history, negative. The patient complained for the past year of pains in the right iliac region with backache and a moderate yellowish vaginal discharge. She denied venereal diseases. On bimanual examination the uterus was found to be slightly enlarged, of normal consistency and in antiflexion. The right tube was thickened and painful on pressure, the posterior cul-de-sac was infiltrated and, on pressure pain was elicited. The cervix was eroded and enlarged. Diagnosis: Salpingitis, posterior parametritis, endometritis, hypertrophied and eroded cervix. Treatment: On April 4th she was given hypodermatically combined vaccine containing streptococci polyvalent 25,000,000, staphylococci polyvalent 250,000,000, and colon polyvalent 100,000,000. She showed a reaction within 10 hours; within 48 hours the pains had subsided. On April 11th double the amount was injected and on April 18th the same dose was repeated. Since her last injection she has been free from all annoyances.

CASE 4.—L. B.; aged 36 years; Russian; married 12 years; no children; no miscarriages; menstrual history, negative. This patient has been complaining for the past two years of backache and a profuse yellowish-white vaginal discharge. She denied venereal disease. On bimanual examination uterus was found to be normal excepting for an eroded cervix. The posterior cul-de-sac was infiltrated and painful on pressure, the utero-sacral ligaments were markedly thickened. Diagnosis: Posterior parametritis, endometritis and eroded cervix. On May 1st she was given hypodermatically combined vaccine (Van Cott), the same dose and the same amount as in the cases cited above. In this case no reaction occurred. On May 8th double the amount was injected and on May 15th the same dose was injected. The discharge ceased and the pains were considerably subdued.

CASE 5.—L. S.; aged 43 years; Russian; married 20 years; six children, youngest 18 months; all normal labors and puerperiums; all breast-fed; no miscarriages; menstrual history, negative. This patient has been suffering for the past three

years of left-sided iliac pain and since of pressure in the right iliac region, backache and of a feeling of heaviness in the pelvis. She denied venereal disease. On bimanual examination the left tube was markedly thickened. The right ovary was cystic and prolapsed, the uterus was descended and in 2° retroversion. Diagnosis: Left salpingitis; prolapsed right cystic ovary; second degree retroversion with discensus uteri. Treatment: On May 5th she was given hypodermatically combined vaccine (Van Cott) in the same dosage and amount as in the above cases. She did not react to the injection. On May 11th double amount was injected; to this she slightly reacted. On May 16th the dose was repeated with only moderate relief of symptoms.

CASE 6.—S. W.; aged 30 years; Russian; married nine years; five children; all normal labors and puerperiums; all breast-fed; no miscarriages; menstrual history, negative. She has been suffering for the past two years prior to March 11, 1911, at which time she came under our care complaining of severe pain in the back and in both iliac regions, colicky in character, with some burning sensations. Bimanual examination elicited left tube slightly thickened with an increase of pain. Marked pain on pressure in posterior cul-de-sac. Diagnosis: Left salpingitis and posterior parametritis. Treatment: She was given combined vaccine (Van Cott) hypodermatically, the same dosage and amount as in above cases. In 24 hours after injection a marked reaction occurred. One week later double the amount was injected with marked improvement of all symptoms. Three days after the last injection the same dose was repeated with an absolute disappearance of all symptoms.

CASE 7.—G. W.; aged 37 years; Russian; married 18 years; seven children, youngest two years; normal labors and puerperiums; all breast-fed; no miscarriages; menstrual history, negative. She came under our notice on March 25, 1911, complaining of backache and a vaginal discharge for the past year. She denied venereal disease. On bimanual examination uterus was found to be normal excepting for a tenacious muco-purulent discharge coming from external os; the posterior cul-de-sac was markedly infiltrated, painful on pressure, and the utero-sacral ligaments thickened. Diagnosis: Posterior parametritis and endometritis. Treatment: She was given hypodermatically combined vaccine (Van Cott) as in the above cases. A slight reaction occurred in eight hours; in 24 hours the pain had diminished somewhat. On March 15th (four days after the first injection) double the amount was injected. On March 18th and 22d the same dose was repeated with relief of all symptoms.

CASE 8.—C. H.; aged 45 years; married 27 years; six children, youngest five years; all normal labors and puerperiums; all breast-fed; no miscarriages; menstrual history, negative. She had been complaining about six months prior to

March 25, 1911, of pain over pelvic region. A diagnosis of parametritis was made and injection of combined vaccine (Van Cott) started, beginning as in Case I, and doubling on the 29th and April 1st and 8th, with no benefit until after two weeks when she was entirely free of all pain.

CASE 9.—S. Y.; aged 30 years; Pole; married 10 years; three children, youngest three years; menstruation every three to four weeks, lasts for three days with severe pain, starting with the onset of the flow and continuing for six days; intra-menstrual pain is in both iliac region extending up on right side and around to back; complains of headache and vomiting at times. These symptoms have continued for the past three years. On examination lacerated cervix, intra-ligamentous cyst both sides, size of orange, one behind the uterus. March 3, 1911, we operated and removed the conditions. Four days after she developed a temperature of 102° F. per reaction, with mass on left side painful and tender to touch. Combined vaccine (Van Cott) was given the next day with a subsiding temperature to 99° F. in morning. That evening her temperature reached 100° F. We were anxious about the case and repeated the dose of vaccine. Eight hours after her temperature was 103° F., which showed we had a negative phase. In three days the temperature was again down to 100° F. Another injection of same vaccine was given the following day. Temperature was 98° F. Examination of mass showed a reduction in size to one-half. She was allowed to sit up in a chair the next day without the occurrence of any trouble. Injections were continued every three days for five injections; all symptoms and mass entirely disappeared.

CASE 10.—S. W.; aged 20 years; single; history, negative, up to February, 1911, at which time she was infected with gonorrhœa. She was treated in the ordinary way. June 3, 1911, she presented herself complaining of bilateral iliac pain, burning on urination, yellowish discharge. Examination showed both tubes slightly enlarged, very tender, discharge from cervix and urethra. Examination of secretion showed diplococci, streptococci and staphylococci. Combined vaccine (Van Cott) was administered and also a permanganate douche twice a day, and she was told to report in three days. On second visit she was much improved. 20 injections were given at three-day intervals, with absolute cure showing both on bimanual examination and microscopical.

CASE 11.—A. L.; aged 19; history, negative. Until April 19, 1911, presented herself complaining of having a vaginal discharge. Microscope showed it to be of gonorrhœa origin. Gonococcus vaccine 25,000,000 was injected every three days and on May 22d was increased to 50,000,000. This was continued to June 12th when 100,000,000 was injected. This was continued once a

week to August. Was an apparent cure. She returned again in October with a discharge, but this time examination of secretion showed only streptococci and staphylococci. Combined vaccine (Van Cott) was then given every three days through October and part of November. From then to December 10th secretion showed a negative result.

CORRESPONDENCE.

The following letter has been received from Dr. Atlee, with the accompanying note:

"My dear Doctor:

"Will you not kindly contribute some data to assist in proving whether the series already collected by one person, and quoted below, has or has not been molded into its present suggestive form through the instrumentality of *leading* questions."

- 1.—Age of patient upon diagnosis of uterine cancer?
- 2.—Age of patient at time of maximum weight?
 - (a) If about as heavy as any other time in her life, at about what age?
- 3.—Age of patient at time of greatest strength and endurance?
 - (a) If about as strong at any other time in her life, at about what age?
- 4.—Age of patient at time of best health?
 - (a) If in about as good health at any other time in her life, at about what age?

Very truly yours,

Philadelphia, Pa.

E. ATLEE.

THE CAUSATION OF UTERINE CANCER.

To the Editor of N. Y. STATE JOURNAL OF MEDICINE:

SIR:—In pursuance of the research which has for its object the determining whether or no the incipient stage of cancer of the uterus is coincident with the maximum weight, strength and health of the patient, a second series of cases has been collected in addition to those already published in *Medical Record*, May 20, 1911. Averaging up both series, which embrace collectively 53 uterine cancer cases and 26 controls (unfortunately no account can be taken of the additional 32 controls which failed to specify any definite time of maximum weight, but which report "Never gained in weight," "Have always been thin," "Indigestion for years," or somewhat similar conditions, which would preclude the probability of maximum weight in recent years), the following results are obtained:

Average age of 32 uterine cancer patients in Series 1, 49 years.

Average age of 20 uterine cancer patients in Series 2, 48 years.

Average age of 13 control cases in Series 1, 53 years.

Average age of 13 control cases in Series 2, 47 years.

(Average age of 32 omitted control cases, 48 years.)

Average maximum weight of 32 uterine cancer patients in Series 1, 3 years ago.

Average maximum weight of 21 uterine cancer patients in Series 2, 4 years ago.

Average maximum weight of 13 control cases in Series 1, 18 years ago.

Average maximum weight of 13 control cases in Series 2, 15 years ago.

Summing up the two series, we get:

Average age of 53 uterine cancer patients, 48 years, 6 months.

Average age of 26 control cases, 50 years.

Average maximum weight of 53 uterine cancer patients, 3 years, six months ago.

Average maximum weight of 26 control cases, 16 years, six months ago.

Conclusion.—The maximum weight of uterine cancer patients is coincident with the incipient stage of the disease.

E. ATLEE.

Philadelphia, Pa.

The Medical Society of the State of New York

17 West 43d Street, New York.

March 15, 1912.

The regular annual meeting of the Medical Society of the State of New York will be held on April 16, 1912, at 10.30 A. M., in the City Hall (Common Council Chamber), corner Maiden Lane and Eagle Street, Albany, N. Y.

WENDELL C. PHILLIPS, M.D., *President*,
WISNER R. TOWNSEND, M.D., *Secretary*.

The regular annual meeting of the House of Delegates of the Medical Society of the State of New York will be held on April 15, 1912, at 8.30 P. M., in the City Hall (Common Council Chamber), corner Maiden Lane and Eagle Street, Albany, N. Y.

WENDELL C. PHILLIPS, M.D., *President*,
WISNER R. TOWNSEND, M.D., *Secretary*.

BY-LAWS.

CHAPTER III.

House of Delegates.

Sec. 8. The following shall be the order of business at the meetings of the House of Delegates:

1. Calling the Meeting to Order.
2. Roll call by the Secretary.
3. Reading of the Minutes of the previous meeting.
4. President's report.
5. Annual report of the Council.
6. Report of the Secretary.
7. Report of the Treasurer.
8. Reports of Standing Committees.
9. Reports of Special Committees.
10. Unfinished business.
11. New business.

Sec. 9. The Officers and Committees of the Society to be elected by the House of Delegates shall be elected at an adjournment of the annual meeting of the House of Delegates, which adjourned meeting shall be held at a convenient hour on the first day of the annual meeting of the Society.

At the election of officers to be held on Tuesday (time to be selected at the meeting on Monday night), the following officers are to be elected:

- A President to succeed Dr. Wendell C. Phillips.
- A First Vice-President to succeed Dr. Peter W. van Peyma.
- A Second Vice-President to succeed Dr. William Francis Campbell.
- A Third Vice-President to succeed Dr. Gilbert D. Gregor.
- A Secretary to succeed Dr. Wisner R. Townsend.
- A Treasurer to succeed Dr. Alexander Lambert.
- A Chairman of the Committee on Scientific Work, to succeed Dr. L. H. Neuman.
- A Chairman of the Committee on Public Health, to succeed Dr. J. M. Van Cott.

A Chairman of the Committee on Legislation, to succeed Dr. Robert P. Bush.

A Chairman of the Committee on Arrangements, to succeed Dr. W. J. Nellis.

Five Delegates to the American Medical Association for two years, to succeed Drs. J. R. Goffe, W. H. Thornton, H. S. Houghton, J. E. Weeks, D. H. Murray.

Five alternates to the American Medical Association for two years, to succeed Drs. C. Stover, E. B. Angell, V. C. Pedersen, G. F. Little, J. O. Roe.

Only members of two years' standing in the American Medical Association are eligible for the position of Delegate or Alternate.

The following proposed amendment to the By-Laws as submitted at the Annual Meeting held in Albany, April 17th, 1911, will be presented for action.

To amend Chapter VIII, Section 1, of the By-Laws, taking Steuben County from the Seventh District Branch and placing it in the Sixth District Branch.

Action on notice presented at last meeting to change time and place of annual meeting. See Constitution, Article VI, Section I. Introduced by Dr. E. Elliot Harris and duly seconded.

BY-LAWS. CHAPTER II.

Meetings.

SECTION 1. Each member in attendance at the annual session of the Society shall enter his name and the name of his county society in the register to be kept by the Secretary of the Society for that purpose. No member shall take part in any of the proceedings at an annual session until he shall have complied with the provisions of this section.

SEC. 2. All registered members may attend and participate in the proceedings and discussions of the general meetings of the Society and of the sections.

REGISTRATION.

The Bureau of Registration and Information will be located in the City Hall. It will be in charge of the Committee on Arrangements. All desiring information or assistance of any kind should apply to the Bureau. After a guest or member has registered he shall receive a badge which shall be evidence of his right to all the privileges of the session, including the entertainment.

COMMITTEE ON ARRANGEMENTS.

William J. Nellis, Chairman; A. W. Booth, Erastus Corning, S. G. Gant, A. G. Root, H. L. K. Shaw, E. A. Vander Veer.

SUB-COMMITTEES.

COMMITTEE ON REGISTRATION AND INFORMATION.

A. W. Booth, Chairman; S. G. Gant, E. A. Vander Veer.

COMMITTEE ON RECEPTION AND ENTERTAINMENT.

S. G. Gant, Chairman; H. L. K. Shaw, A. G. Root.

COMMITTEE ON HALLS.

Erastus Corning, Chairman; A. G. Root, S. G. Gant.

COMMITTEE ON BADGES, PRINTING, MUSIC.

A. G. Root, Chairman; H. L. K. Shaw, Erastus Corning.

COMMITTEE ON SCIENTIFIC AND COMMERCIAL EXHIBITS.

H. L. K. Shaw, Chairman; Erastus Corning, S. G. Gant.

COMMITTEE ON AUTOMOBILES.

E. A. Vander Veer, Chairman; A. G. Root, H. L. K. Shaw.

GENERAL PROGRAM.

ARRANGED BY THE COMMITTEE ON SCIENTIFIC WORK.

Leo. H. Neuman, Chairman, Albany, N. Y.
Henry L. Elsner, Syracuse, N. Y.
Thomas J. Harris, New York City.
And the Officers of the Sections.

BY-LAWS, MEDICAL SOCIETY OF THE STATE OF NEW YORK, CHAPTER X, SECTION 2.

"All papers read before the Society by its members shall become the property of the Society. Permission may be given, however, by the House of Delegates or the Committee on Publication to publish such paper in advance of its appearance in the NEW YORK STATE JOURNAL OF MEDICINE."

TUESDAY, APRIL 16TH,

10.30 A. M.

City Hall, Common Council Chamber. 106th Annual Meeting of the Medical Society of the State of New York.

11 A. M.

Emmanuel Baptist Church. General Meeting open to the public.

Invocation by the Rev. Alexander H. Abbott, Pastor Emmanuel Baptist Church.

Opening Remarks by the President, Wendell C. Phillips, M.D., New York City.

Address of Welcome, by Hon. John A. Dix, Governor of the State of New York.

Address of Welcome, by Hon. James B. McEwan, Mayor of Albany.

Greetings from the American Medical Association, Abraham Jacobi, M.D., President-Elect, New York City.

Annual Oration on Medicine—"Relation of Exact Science to Medicine." Harvey W. Wiley, M.D., Chemist and Chief, Bureau of Chemistry, Department of Agriculture, Washington, D. C., by invitation.

1 P. M.

Subscription luncheon (50 cents), German Hall.

2.30 P. M.

Meeting of Five Sections.

Section on Medicine—City Hall, Common Council Chamber.

Section on Surgery—City Hall, Supervisors' Room.

Section on Diseases of Eye, Ear, Nose and Throat—Albany Medical College.

Section on Mental and Nervous Diseases, Eugenics and Medical Expert Testimony—Historical and Art Society Rooms.

Section on Public Health and Preventive Medicine—Emmanuel Baptist Church.

8.30 P. M.

State Capitol, Assembly Chamber. General Meeting, Open to the Public.

ADDRESSES ON

Prevention of Deafness and the Instruction of the Deaf Child—G. Hudson Makuen, M.D., Philadelphia, Pa., by invitation.

Prevention of Insanity—Albert Warren Ferris, M.D., Watkins, N. Y.

The Present Status of the Movement for the Prevention of Tuberculosis in this State—Homer Folks, Esq., State Charities Aid Association, New York, by invitation.

Prevention of Blindness and the Instruction of the Blind Child—George E. de Schweinitz, M.D., Philadelphia, Pa., by invitation.

WEDNESDAY, APRIL 17TH.

9 A. M.

Meeting of Sections.

2 P. M.

General Meeting, Emmanuel Baptist Church.

Annual Oration on Surgery—The Duty of the Family Physician in the Management of Surgical Cases—John M. T. Finney, M.D., Assoc. Prof. of Surgery Johns Hopkins University, Baltimore, Md., by invitation.

3 P. M.

Meeting of Sections.

JOINT SESSION—SECTIONS ON MEDICINE AND EYE, EAR, NOSE AND THROAT.

City Hall, Common Council Chamber.

SYMPOSIUM ON VERTIGO.

See Programs of Sections on Medicine and Eye, Ear, Nose and Throat.

8 P. M.

State Capitol, Assembly Chamber. General Meeting, Open to the Public.

Oration—"The Benefits of Vivisection to Mankind," Walter B. Cannon, M.D., Professor of Physiology, Harvard Medical School, Boston, Mass., by invitation.

9 P. M.

Reception to the President—Entertainment, Dancing and Supper, Hotel Ten Eyck. Tickets, including supper, \$2.00.

THURSDAY, APRIL 18TH.

9.30 A. M.

Meeting of Sections.

Joint Session—Sections on Medicine and Surgery.

City Hall, Common Council Chamber.

Symposium on Poliomyelitis (Infantile Paralysis).

Symposium on Hyperthyroidea.

See Programs of Sections on Medicine and Surgery.

2 P. M.

Meeting of Sections.

SECTION PROGRAMS.

The order of reading papers will be in accordance with the printed program.

SECTION ON MEDICINE.

Chairman, Henry L. Elsner, M.D., Syracuse.

Secretary, Harold Barclay, M.D., New York City.

Place of Meeting—City Hall, Common Council Chamber.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. A Clinical Study of Relapses in Typhoid Fever—Herman F. L. Ziegel, M.D., New York City.

2. Congestion of the Liver—Benjamin W. Stearns, M.D., Unadilla.

Discussion introduced by Julian C. Smith, M.D., Oneonta.

3. Vaccine Therapy in Medicine—T. Wood Clarke, M.D., Utica.

4. Graphic Methods in the Diagnosis of Heart Lesions, with Illustrations—Leo H. Neuman, M.D., Albany.

5. The Signs of Overdosage in Digitalis Administration—Walter A. Bastedo, M.D., New York City.

6. The Physical Treatment of Arterial Hypertension—Edward C. Titus, M.D., New York City.

Discussion introduced by Egbert Le Fevre, M.D., New York City.

7. Hydrotherapy and Mechano-Therapy of Arterio-Sclerosis—John M. Swan, M.D., Rochester.

8. The Significance of an Acid Gastric Juice in the Fasting Stomach—Harold Barclay, M.D., New York City.

9. Hyperacidity—George R. Lockwood, M.D., New York City. Discussion introduced by Maurice Gross; M.D., New York City.

10. The Water-trap Stomach, its Diagnosis and Treatment—G. Reese Satterlee, M.D., New York City; Leon T. Le Wald, M.D., New York City.

Discussion by Charles G. Stockton, M.D., Buffalo; Egbert Le Fevre, M.D., and Alexander Lambert, M.D., New York City.

WEDNESDAY, APRIL 17TH.

9 A. M.

11. Toxæmia of Pregnancy, a Consideration of Treatment—William M. Brown, M.D., Rochester.

12. Treatment of Typhoid Carriers—Frederick M. Meader, M.D., Syracuse, by invitation.

Discussion introduced by Charles F. Bolduan, M.D., New York City by invitation.

13. The Results of the Early Diagnosis of Urinary Tuberculosis—Walter F. Braasch, M.D., Rochester, Minn., by invitation.

14. Relative Value of Air, Food and Rest in the Treatment of Pulmonary Tuberculosis—Lawrason Brown, M.D., Saranac Lake.

Discussion opened by Henry B. Doust, M.D., Syracuse.

15. The Value of Digitalis and Arsenic in the Treatment of Pulmonary Tuberculosis—Abraham Jacobi, M.D., New York City.

16. Reciprocal Relations of Cardiac and Hepatic Disease—Alfred Stengel, M.D., Philadelphia, Pa., by invitation.

17. Clinical Vagaries in Certain Forms of Liver Disease—Nathan E. Brill, M.D., New York City.

18. The General Care of an Emphysematous Patient—William M. Gibson, M.D., Utica.

19. Cardiac Sequelæ of Tonsillar Infection—Joseph R. Wiseman, M.D., Syracuse.

Discussion introduced by Henry L. Elsner, M.D., Syracuse.

20. Non-Surgical Treatment of Exophthalmic Goitre—Solomon Solis Cohen, M.D., Philadelphia, Pa., by invitation.

21. Eczema in Infants and Young Children—Charles G. Kerley, M.D., New York City.

3 P. M.

JOINT SESSION OF THE SECTION ON MEDICINE WITH THE SECTION ON EYE, EAR, NOSE AND THROAT.

SYMPOSIUM ON VERTIGO.

For Section on Medicine:

22. Vertigo from the Standpoint of the General Practitioner—Charles G. Stockton, M.D., Buffalo.

23. Vertigo Due to Lesions of the Central Nervous System—Joseph Collins, M.D., New York City.

For Section on Eye, Ear, Nose and Throat:

Vertigo Due to Ocular Causes—Percy Fridenberg, M.D., New York City.

Labyrinthine Vertigo—Philip D. Kerrison, M.D., New York City.

Vertigo Due to Middle-Ear Causes—James F. McKernon, M.D., New York City.

Discussion to be opened by John E. Weeks, M.D., Arthur B. Duel, M.D., Francis Valk, M.D., Edward D. Fisher, M.D., New York City; Thomas H. Farrell, M.D., Utica; Joseph A. Kenefick, and Alexander Lambert, M.D., New York City.

24. Further Studies on Endocarditis—Edward C. Rosenow, M.D., Chicago, Ill., by invitation.

25. The Relation of the State to Medical Education—John L. Heffron, M.D., Syracuse.

26. A Medical Sociological Study—Walter H. Kidder, M.D., Oswego.

THURSDAY, APRIL 18TH.

9.30 A. M.

JOINT SESSION OF THE SECTIONS ON MEDICINE AND SURGERY.

SYMPOSIUM ON POLIOMYELITIS (INFANTILE PARALYSIS).

For Section on Medicine:

27. Pathology—George Draper, M.D., New York City.

28. Symptoms, Difficulties and Possibilities in Early Diagnosis—R. Foster Kennedy, M.D., New York City, by invitation.

29. The Acute Stage—Francis W. Peabody, M.D., New York City, by invitation.

30. Medical Treatment—David E. Hoag, M.D., New York City.

For Section on Surgery:

Prevention and Correction of Deformities by Mechanical Treatment—Wisner R. Townsend, M.D., New York City.

Surgical Treatment—Henry Ling Taylor, M.D., New York City.

Discussion opened by Rufus I. Cole, M.D., Rockefeller Institute, New York City. Smith Baker, M.D., Utica; L. Pierce Clark, M.D., New York City.

This symposium is based largely on the recent experiences (clinical and pathological) from the Hospital of the Rockefeller Institute.

SYMPOSIUM ON HYPERTHYROIDIA.

Perverted Thyroid Function.

For Section on Medicine:

31. Symptomatology—George Dock, M.D., St. Louis, Mo., by invitation.

32. Atypical Types—Alexander Lambert, M.D., New York City.

33. Pathology—William C. MacCarty, M.D., Rochester, Minn., by invitation.

34. The Medical Treatment—S. S. Beebe, M.D., New York City, by invitation.

Discussion introduced by Glentworth R. Butler, M.D., Brooklyn.

For Section on Surgery:

The Surgical Treatment—Martin B. Tinker, M.D., Ithaca.

Discussion by George E. Beilby, M.D., Albany, by invitation.

2 P. M.

35. The Influence of Respiration upon the Pulse Rate—Robert H. Halsey, M.D., New York City.

36. Syphilis of the Stomach—Jerome Meyers, M.D., Albany.

37. Alopecia Areata: Its Causative Factors and Therapy—Paul E. Bechet, M.D., New York City.

SECTION ON SURGERY.

Chairman, Parker Syms, M.D., New York City.

Secretary, James N. Vander Veer, M.D., Albany.

Place of Meeting, City Hall, Supervisors' Room.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. Surgery of the Battlefield—Surgeon General George H. Torney, U. S. Army, by invitation.

2. Old Dislocations of Shoulder and Elbow, Surgical Treatment of—Lucius W. Hotchkiss, M.D., New York City.

3. Treatment of Simple Fractures by the Open Method—John B. Walker, M.D., New York City.

4. Treatment of Simple Fractures by the Closed Method—James M. Hitzrot, M.D., New York City.

Discussion on papers 3 and 4 opened by Arthur W. Elting, M.D., Albany; followed by Samuel Lloyd, M.D., New York City; Ralph R. Fitch, M.D., Rochester.

5. Lateral Curvature of the Spine—Walter Truslow, M.D., Brooklyn, New York.

6. Operations in Potts Disease—Russell A. Hibbs, M.D., New York City.

Discussion opened by Charlton Wallace, M.D., New York City; followed by Clarence E. Coon, M.D., Syracuse.

7. X-Ray Pictures of the Urinary Tract—Henry D. Furniss, M.D., New York City.

8. X-Ray Pictures of the Kidney—Edward L. Keyes, Jr., M.D., New York City.

WEDNESDAY, APRIL 17TH.

9 A. M.

9. Suprapubic Prostatectomy—Paul M. Pilcher, M.D., Brooklyn.

10. Cancer of the Prostate—Eugene Fuller, M.D., New York City.

Discussion on papers 9 and 10 opened by Nathan Jacobson, M.D., Syracuse, followed by J. Bentley Squier, M.D., New York City, and James N. Vander Veer, M.D., Albany.

11. Rupture of the Kidney in Children—Charles L. Gibson, M.D., New York City.

12. Intestinal Injuries, due to Contusion of the Abdomen—Gilbert D. Gregor, M.D., Watertown.

Discussion by Robert Tuttle Morris, M.D., New York City.

13. Bismuth Paste (Beck's Paste) Its Therapeutic Uses in Surgery—Emil G. Beck, M.D., Chicago, Ill., by invitation.

Discussion by Howard Lilienthal, M.D., New York City.

14. Gastric and Duodenal Ulcers—Indications for Operation—Grant C. Madill, M.D., Ogdensburg.

Discussion by Edgar Vander Veer, M.D., Albany.

15. A Plea for Early Diagnosis in Surgical Affections—Alvah H. Traver, M.D., Albany.

16. Operations Under Anesthesia by Intratracheal Insufflation—Charles A. Elsberg, M.D., New York City.

3.00 P. M.

17. Surgery of the Bile Ducts—John B. Deaver, M.D., Philadelphia, Pa., by invitation.

18. Biliary Colic without Gall Stones—Irving S. Haynes, M.D., New York City.

19. Control of Hemorrhage in Operations upon the Liver—Burton J. Lee, M.D., New York City.

Discussion on papers 17, 18 and 19 opened by Joseph D. Bryant, M.D., New York City, followed by Edwin M. Stanton and Charles G. McMullen, Schenectady.

20. Constipation, Surgical Aspects of—Samuel S. Gant, M.D., New York City.

21. Prolapse of the Rectum, a New Operation for—Alexis V. Moschcowitz, M.D., New York City.

Discussion by Dwight H. Murray, M.D., Syracuse, and James P. Tuttle, M.D., New York City.

THURSDAY, APRIL 18TH.

9.30 A. M.

JOINT SESSION OF THE SECTIONS ON MEDICINE AND SURGERY.

SYMPOSIUM ON POLIOMYELITIS (INFANTILE PARALYSIS).

For Section on Medicine:

Pathology—George Draper, M.D., New York City.

Symptoms, Difficulties and Possibilities in Early Diagnosis—R. Foster Kennedy, M.D., New York City, by invitation.

The Acute Stage—Francis W. Peabody, M.D., New York City, by invitation.

Medical Treatment—David E. Hoag, M.D., New York City.

For Section on Surgery:

22. Prevention and Correction of Deformities by Mechanical Treatment—Wisner R. Townsend, M.D., New York City.

23. Surgical Treatment—Henry Ling Taylor, M.D., New York City.

Discussion opened by Rufus I. Cole, M.D., Rockefeller Institute, New York City; Smith Baker, M.D., Utica; L. Pierce Clark, M.D., New York City.

This symposium is based largely on the recent experiences (clinical and pathological) from the Hospital of the Rockefeller Institute.

SYMPOSIUM ON HYPERTHYROIDISM.

Perverted Thyroid Function—

For Section on Medicine:

Pathology—William C. MacCarty, M.D., Rochester, Minn., by invitation.

Symptomatology—George Dock, M.D., St. Louis, Mo., by invitation.

Atypical Types—Alexander Lambert, M.D., New York City.

The Medical Treatment—S. S. Beebe, M.D., New York City, by invitation.

Discussion opened by Glentworth R. Butler, M.D., Brooklyn.

For Section on Surgery:

24. Surgical Treatment—Martin B. Tinker, M.D., Ithaca.

Discussion by George E. Beilby, M.D., Albany, by invitation.

2 P. M.

25. Wounds of Naval Warfare—Surgeon General Charles Stokes, U. S. Navy, by invitation.

26. Induction of Labor at Term—George W. Kosmak, M.D., New York City.

27. The Use of Fœtal Serum to Cause the Onset of Labor—Abraham J. Rongy, M.D., New York City.

28. Abdominal Cæsarian Section, Indications for—Ross McPherson, M.D., New York City.

29. Prolapse of the Uterus—Its Surgical Treatment—Charles Clifford Barrows, M.D., New York City.

30. Uterine Fibroids Complicating Pregnancy—Ralph Waldo, M.D., New York City.

31. Cancer of the Uterus, Radical Operation for—Le Roy Broun, M.D., New York City.

Discussion by John A. Sampson, M.D., Albany; Willis E. Ford, M.D., Utica; Wm. Seaman Bainbridge, M.D., New York City.

32. Epithelioma of the Eyelids—S. Busby Allen, M.D., Patchogue.

SECTION ON DISEASES OF THE EYE, EAR, NOSE AND THROAT.

Chairman, Edward Bradford Dench, M.D., New York City.

Secretary, James Francis McCaw, M.D., Watertown.

Place of Meeting—Albany Medical College.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. Chairman's Address—Edward B. Dench, M.D., New York City.

SYMPOSIUM ON THE CAUSES OF DEAFNESS.

2. Deafness as a Result of Diathetic and Constitutional Conditions—Sargent F. Snow, M.D., Syracuse.

3. Deafness as a Result of Middle-Ear Suppuration—Samuel J. Kopetzky, M.D., New York City.

4. Deafness as a Result of Otosclerosis—John E. Sheppard, M.D., Brooklyn.

5. Deafness as a Result of Congenital, Traumatic and Toxic Causes—Arthur G. Root, M.D., Albany.

Discussion to be opened by John B. Rae, M.D., Gorham Bacon, M.D., New York City; W. Scott Renner, M.D., Frank W. Hinkle, M.D., Buffalo; Thomas H. Halsted, M.D., Syracuse; John L. Adams, M.D., New York City; Bradford A. Richards, M.D., Rochester.

6. Tinnitus Aurium, Its Significance in Certain Diseases of the Ear—Edmund P. Fowler, M.D., New York City.

Discussion to be opened by W. Sohler Bryant, M.D., and George F. Cott, M.D., Buffalo.

7. Modern Surgery of the Tonsil—Thomas H. Halsted, M.D., Syracuse. Discussion by Thomas J. Harris, M.D., New York City; John O. Roe, M.D., Rochester; W. Scott Renner, M.D., Buffalo, and Robert C. Myles, M.D., New York City.

8. Palate and Lip Surgery; Aims and Results—Truman W. Brophy, M.D., Chicago, Ill., by invitation.

WEDNESDAY, APRIL 17TH.
9 A. M.

9. Occupational Diseases of the Eye—Ward A. Holden, M.D., New York City.

10. Occupational Diseases of the Ear, Nose and Throat—W. Sohler Bryant, M.D., New York City.

Discussion by Ellice M. Alger, M.D., New York City; John E. Sheppard, M.D., Brooklyn; Frank E. Miller, M.D., Herbert W. Wooten, M.D., New York City.

11. Effects of Salvarsan on the Eye—Robert G. Reese, M.D., New York City.

12. Effects of Salvarsan on the Ear—Charles E. Perkins, M.D., New York City.

Discussion on both papers to be opened by John A. Fordyce, M.D., Emil Gruening, M.D., Arthur B. Duel, M.D., New York City, and Clement F. Theisen, Albany.

13. Some Cases Illustrating Ocular Disturbances Due to Disease of the Nose and Accessory Sinuses—John E. Weeks, M.D., New York City.

14. The Surgical Management of Nasal Accessory Sinus Disease—Lewis A. Coffin, M.D., New York City.

15. (a) Acute Frontal Sinusitis with Orbital Perforation and Meningitis. Operation—Recovery.

(b) Chronic Frontal Sinusitis with Erosion of Inner Cranial Plate and Extra Dural Abscess. Operation—Recovery—Seymour Oppenheimer, M.D., New York City.

Discussion on above papers opened by Cornelius G. Coakley, M.D., New York City; Stephen H. Lutz, M.D., Brooklyn; T. Passmore Berens, M.D., William K. Simpson, M.D., H. Holbrook Curtis, M.D., Harmon Smith, M.D., New York City, and Beaman Douglas, M.D., New York City, by invitation.

3 P. M.

JOINT SESSION OF THE EYE, EAR, NOSE AND THROAT SECTION WITH SECTION ON MEDICINE.

SYMPOSIUM ON VERTIGO.

For Section on Medicine:

Vertigo From the Standpoint of the General Practitioner—Charles G. Stockton, M.D., Buffalo.

Vertigo Due to Lesions of the Central Nervous System—Joseph Collins, M.D., New York City.

For Section on Eye, Ear, Nose and Throat:

16. Labyrinthine Vertigo—Philip D. Kerrison, M.D., New York City.

17. Vertigo Due to Middle-Ear Causes—James F. McKernon, M.D., New York City.

18. Vertigo Due to Ocular Causes—Percy Fridenberg, M.D., New York City.

Discussion to be opened by John E. Weeks, M.D., Arthur B. Duel, M.D., Francis Valk, M.D., Edward D. Fisher, M.D., New York City; T. H. Farrell, M.D., Utica; Joseph A. Kenefick, and Alexander Lambert, M.D., New York City.

THURSDAY, APRIL 18TH.
9 A. M.

SYMPOSIUM ON THE CAUSES OF BLINDNESS.

19. Blindness as a Result of Inflammatory Disease Affecting the Conjunctiva—Colman Ward Cutler, M.D., New York City.

20. Blindness as a Result of Intraocular Disease—Edgar S. Thomson, M.D., New York City.

21. Blindness Due to Toxemia—Arnold Knapp, M.D., New York City. Discussion by Lucien Howe, M.D., Buffalo, and Walter E. Lambert, M.D., New York City; F. Park Lewis, M.D., Buffalo; Charles H. May, M.D., New York City; G. Griffin Lewis, M.D., Syracuse; A. Edward Davis, M.D., Walter B. Weidler, M.D., New York City.

22. Some Common Results of Eye Strain—William R. Broughton, M.D., New York City.

Discussion by George T. Stevens, M.D., Percy Fridenberg, New York City, and Julius H. Kevand, Syracuse, by invitation.

23. An Optimistic View of Migraine—Ellice M. Alger, M.D., New York City.

Discussion by Sherman Voorhees, M.D., Elmira;

Ward A. Holden, M.D., New York City; William G. Dobson, M.D., Poughkeepsie.

24. Some Ocular Observations in Brain Tumor—Sherman Voorhees, M.D., Elmira.

Discussion by Peter A. Callan, M.D., New York City; John H. Claiborne, M.D., New York City.

2 P. M.

25. Exhibitions of Sections of Temporal Bones. Dry Specimens Showing the Nasal Accessory Sinuses—William M. Dunning, M.D., New York City.

26. The Submucous Operation and Some of its Difficulties—Isaac M. Heller, M.D., New York City.

27. Karatitis Neuroparalytica after Removal of the Gasserian Ganglia—Walter B. Weidler, M.D., New York City.

28. Present Status of Vaccine Therapy in Purulent Diseases of the Ear—Rene H. Huvelle, M.D., New York City.

SECTION ON MENTAL AND NERVOUS DISEASES, EUGENICS, AND MEDICAL EXPERT TESTIMONY.

Chairman, Albert Warren Ferris, M.D., Watkins.

Secretary, Edward L. Hanes, M.D., Rochester.

Place of Meeting—Historical and Art Society Rooms.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. Institutional Training of the Feeble-Minded—Charles S. Little, M.D., Supt., Letchworth Village, Thiells, by invitation. Discussion opened by Henry H. Goddard, Ph.D., Supt. of the Training School, Vineland, N. J., by invitation.

2. Eugenics—Charles B. Davenport, Ph.D., Sec. American Breeders Association, Cold Spring Harbor, L. I., by invitation. Discussion opened by Aaron J. Rosanoff, M.D., Kings Park.

3. Primary Sources of Tuberculous Infection, and Their Relation to Eugenics—S. Adolphus Knopf, M.D., New York City.

4. The Treatment of Locomotor Ataxia—Edward Livingston Hunt, M.D., New York City.

5. Report of a Case of Acromegalia with Autopsy—Hermon C. Gordinier, M.D., Troy, and William Kirk, Jr., M.D., Troy.

6. Paralytic Complications of Migraine—J. Ramsay Hunt, M.D., New York City.

WEDNESDAY, APRIL 17TH.

9 A. M.

7. Some Therapeutic Considerations Based on the Pathogenesis of Epilepsy—L. Pierce Clark, M.D., New York City.

8. Indications for Surgical Intervention in Epilepsy—Edward A. Sharp, M.D., Buffalo. Discussion opened by Edgar R. McGuire, M.D., Buffalo.

9. Practical Results of Surgery in Epilepsy—C. Kirby Collier, M.D., Craig Colony, Sonyea. Discussion opened by J. F. Munson, M.D., Craig Colony, Sonyea.

10. Family Periodic Paralysis, With Report of Two Cases—Charles E. Atwood, M.D., New York City. Discussion by Edward B. Angell, M.D., Rochester, and Anthony Bassler, M.D., New York City.

11. The Only Child, or Favorite Child in Adult Life—Abraham A. Brill, M.D., New York City. Discussion by Smith Ely Jelliffe, M.D., and Horace W. Frink, M.D., New York City, by invitation.

12. Cerebral Abscess, with Presentation of Patient—LaSalle Archambault, M.D., Albany. Discussion by Wm. Seaman Bainbridge, M.D., New York City, and Robert Lewis, M.D., New York City, and R. Foster Kennedy, M.D., New York City, by invitation.

13. Hereditary Chorea—Evelyn P. Ballantine, M.D., Rochester. Discussion opened by Smith Ely Jelliffe, M.D., New York City.

3 P. M.

14. The Relation of Toxic and Infectious Causes to Psychoses—August Hoch, M.D., Director Psychiatric Institute, Ward's Island, New York City, by invitation.

15. Dementia Præcox Deteriorations Without Delusions or Hallucinations, a Type Most Frequent Outside of Hospitals—George H. Kirby, M.D., Director of Clinical Psychiatry, Manhattan State Hospital, New York City. Discussion by Morris J. Karpas, M.D., New York City, by invitation.

16. Speech in Nervous Diseases; with lantern slide demonstration of voice records—Edward W. Scripture, M.D., New York City. Discussion by J. Ramsay Hunt, M.D., of New York City and August Hoch, M.D., New York City, by invitation.

17. Medical Work in the State Hospitals, and the Year's Report—Charles W. Pilgrim, M.D., Supt. Hudson River State Hosp., Poughkeepsie. Discussion by James V. May, M.D., President, State Commission in Lunacy, Albany, and Walter H. Kidder, M.D., Oswego.

18. Some Notes on the Compulsion Neuroses—Smith Ely Jelliffe, M.D., New York City. Discussion opened by A. A. Brill, M.D., New York City.

19. Rôle of Education in the Prevention of Insanity—C. Macfie Campbell, M.D., Bloomington Hospital, White Plains, by invitation.

Discussion by Mr. Everetts Ellwood, New York City, by invitation.

20. Presenile Dementia (Alzheimer's Disease), with lantern slide—Charles I. Lambert, M.D., Psychiatric Institute, Ward's Island, New York City, by invitation. Discussion by Charles B. Dunlap, M.D., New York City, by invitation.

THURSDAY, APRIL 18TH.

9 A. M.

21. Medical Expert Testimony from the Alienist's Standpoint—Carlos F. MacDonald, M.D., New York City. Discussion opened by Eugene H. Howard, M.D., Supt. State Hospital, Rochester.

22. Medical Expert Testimony from the Lawyer's Standpoint—William A. Purrington, Esq., New York City, by invitation.

23. Medical Expert Testimony from the Justice's Standpoint—Hon. Randall J. Le Boeuf, Albany, former Justice of the Supreme Court of New York, by invitation.

24. Regulation of Expert Testimony—Charles L. Dana, M.D., New York City.

Discussion opened by J. Montgomery Mosher, M.D., Albany.

25. The Medical Expert and the Proposed Changes in the Law Governing the Defense of Insanity in Homicide Cases—Arthur C. Brush, M.D., Brooklyn. Discussion by J. B. Ransom, M.D., Dannemora.

26. Nervous and Mental Symptoms Due to Disturbed Circulation, with Illustrative Cases, and Notes on Treatment—Frank H. Stephenson, M.D., Syracuse. Discussion opened by Bradford C. Loveland, M.D., Syracuse.

27. Toxic Deliria; Report of Cases—Nishan A. Pashayan, M.D., Schenectady. Discussion by George H. Kirby, M.D., New York City, and Otto G. T. Kiliani, M.D., New York City.

28. After Ten Years; A Review of Experience With Gastric Neurasthenia and the Abdominal Postures—Bradford C. Loveland, M.D., Syracuse.

SECTION ON PUBLIC HEALTH AND PREVENTIVE MEDICINE.

Chairman, Joshua M. Van Cott, M.D., Brooklyn.
Secretary, Allen Arthur Jones, M.D., Buffalo.

Place of Meeting—Emmanuel Baptist Church.
Open to the Public.

TUESDAY, APRIL 16TH.

2.30 P. M.

1. The Public Hospitals of New York State—Hon. Robert W. Heberd, Secretary, State Board of Charities, by invitation.

2. Milk as a Factor in the Promotion of Public Health—Godfrey R. Pisek, M.D., New York City.

3. The Night Camp and its Place in Tuberculosis—H. Holbrook Curtis, M.D., New York City.

4. The Mineral Springs of Saratoga—George H. Fish, M.D., Saratoga Springs.

5. The Necessity of Examining Those Exposed to Pulmonary Tuberculosis—John H. Pryor, M.D., Buffalo.

6. The Rôle of the Dispensary and the Day Camp in the Anti-Tuberculosis Movement—George J. Eckel, M.D., Buffalo.

WEDNESDAY, APRIL 17TH.

9 A. M.

7. The Necessity of Trained Men in Public Health Work—Eugene H. Porter, M.D., Commissioner of Health, State of New York, New York City, by invitation.

8. Tropical Medicine—Lieut. S. M. Shook, Medical Corps, U. S. Army, by invitation.

9. Tropical Climate and its Physiological Effects—Capt. James M. Phalen, Medical Corps, U. S. Army, by invitation.

10. Typhoid Prophylaxis—Major F. F. Russell, Medical Corps, U. S. Army, by invitation.

11. The Epidemiology of Typhoid Fever and its Relation to the Practitioner—Theodore Horton, C.E., Chief Sanitary Engineer, by invitation.

12. The Early Use of Antitoxins—William S. Magill, M.D., Director State Laboratories, New York City, by invitation.

13. Anaphylaxis—Benjamin White, M.D., Hoagland Laboratory, Brooklyn, by invitation.

3 P. M.

14. Prophylaxis in Diphtheria—Franklin C. Gram, M.D., Buffalo.

15. State vs. National Quarantine—Algernon T. Bristow, M.D., Brooklyn.

16. Public Health Work in Cities—Francis E. Fronczak, M.D., Buffalo.

17. Public Health Work in Rural Communities—Charles S. Prest, M.D., Waterford, by invitation.

18. Public Health and Public Recreation—Luther H. Gulick, M.D., Russell Sage Foundation, New York City.

19. Public Health and the Child—Le Grand Kerr, M.D., Brooklyn.

THURSDAY, APRIL 18TH.

9.30 A. M.

20. To be announced—Medical Work in the Canal Zone.

21. Water Pollution and Typhoid Fever—Henry R. Hopkins, M.D., Buffalo.

22. Pollution of the Harbor Waters of New York, Especially Referring to Bearing on Health—Linsly R. Williams, M.D., New York City.

23. Smallpox and Vaccination—Frederic C. Curtis, M.D., Albany.

24. Defective Eyesight in Children—Frederick J. Mann, M.D., Poughkeepsie.

Discussion by Mrs. Cynthia Westover Alden, President National Sunshine Association, New York City, by invitation.

25. Public Health Education Among Women—Cora B. Lattin, M.D., Ithaca, by invitation.

26. Value of Municipal Control in Child Hygiene—S. Josephine Baker, M.D., Dept. Child Hygiene, New York City. Discussion opened by Rosalie Slaughter Morton, M.D., New York City.

27. Certain Amendments to Articles 2 and 3 of the Public Health Law—William B. Hanbidge, M.D., Ogdensburg.

28. Possible Helps in the Control of the Black and White Plagues—Joseph Roby, M.D., Rochester.

2 P. M.

29. Observations on Industrial Hygiene with a Practical Method of Conserving the Vital Resources of Employees—Frederic W. Loughran, M.D., New York City.

30. The Significance of the Physician of Physiological Age—Charles W. Crampton, M.D., New York City.

31. The Social Evil—James Pedersen, M.D., New York City.

32. The Health Laws of New York—Frank Overton, M.D., Patchogue.

33. The Practicing Physician's Contribution to Public Health Work—William A. Howe, M.D., Deputy Commissioner of Health, Phelps.

Through the courtesy of the President of the State Department of Health, E. H. Porter, M.D., the laboratories of the State Department of Health will be open for inspection, and all member of the medical profession are cordially invited to the exhibit.

ANNOUNCEMENT.

Members are requested to secure accommodations in advance by writing to the hotels and boarding houses. If a member arrives at Albany without having secured accommodations, he should apply at once to the Committee on Registration and Information, which will be found at the Registration Booth in the City Hall.

HOTELS.

Ten Eyck, with annex; The Hampton; The Kenmore; Stanwix Hall; are managed on the European plan, with rooms ranging in price from \$1.50 per person up. Keeler's (for men only), rooms \$1.00 up; Globe, rooms from \$1.00 up; Am. plan, \$2.50. The Gainsborough; The Lodge, rooms from \$1.00 up.

BOARDING HOUSES.

M. Phelan, 1 Chestnut St.; F. A. Ingomire, 70 Chestnut St.; Mrs. E. F. Williams, 46 Chestnut St.; Mrs. Margaret Hartnett, 93 Columbia St.; Mrs. Mahar, 103 Columbia St.; Mrs. Thompson, 52 Dove St.; Mrs. D. H. Bolles, 66 Dove St.; Mrs. Dickerman, 66 Eagle St.; Mrs. Van Kleek, 66 Eagle St.; Mrs. Hamilton, 69 Eagle St.; G. D. Jones, 73 Eagle St.; Mrs. Katherine Lewis, 106 Eagle St.; Miss E. Graham, 101 Eagle St.; Mrs. E. A. Bailey, 131 Eagle St.; Mrs. J. N. Bondreau, 32 Elk St.; Mrs. Gilbert, 28 S. Hawk St.; Joseph W. Tessier, 34 S. Hawk St.; Mrs. N. E. Ferron, 62 S. Hawk St.; Mrs. L. C. Winhold, 72 S. Hawk St.; Mrs. S. M. Steigelman, 86 Hudson Ave.; Mrs. Richard N. Johnson, 135 Hudson Ave.; Mrs. I. J. Shafer, 136 Hudson Ave.; Mrs. N. Gibbons, 140 Hudson Ave.; Mrs. K. Toohey, 191 Hudson Ave.; Mrs. W. V. Johnstone, 197 Hudson Ave.; Mrs. G. E. Wilson, 222 Hudson Ave.; Mrs. Townsend, 228 Hudson Ave.; Mrs. W. Sweers, 246 Hudson Ave.; Mrs. Gallup, 254 Hudson Ave.; Franklin W. Scott, 275 Hudson Ave.; M. E. Hastings, 282 Hudson Ave.; Mrs. F. L. Harcourt, 304 Hudson Ave.; Mrs. D. Pollock, 305 Hudson Ave.; Mrs. Handigo, 318 Hudson Ave.; Mrs. L. L. Miller, 24 Hudson Ave.; Mrs. John Haas, 47 Jay St.; Mrs. B. Ijanes, 86 Jay St.; Miss J. Carr, 186 Jay St.; Mrs. L. H. Hathaway, 225 Jay St.; Mrs. J. A. Carroll, 6 Jefferson St.; Mrs. Jennie M. Long, 93 Jefferson St.; Mrs. D. Lowman, 32 Lancaster St.; Mrs. F. C. Stevens, 11½ Lancaster St.; Mrs. J. C. Haight, 86 Lancaster St.; Bertha L. Nuths, 71 Lancaster St.; C. M. Powers, 94 Lancaster St.; Mrs. W. L. Le Fevre, 99 Lancaster St.; Mrs. S. B. Smith, 163 Lancaster St.; The Lodge, 2 and 3 Lodge St.; Henry B. Wilkins, 12 Park St.; Mrs. Toombs, 16 Park St.; Mrs. Farley, 17 Park St.; Miss Tilson, 5 Pine St.; M. Bailey, 34 Spring St.; Mrs. W. N. Sullivan, 44 Spring St.; Mrs. H. Wrighton, 84 S. Swan St.; Mrs. Frank H. Dans, 105 S. Swan St.; Mrs. McDermott, 154 S. Swan St.; Mrs. A. H. King, 12 Washington Ave.

SUGGESTIONS TO ENDORSING OFFICER OF MEETING IN INSTRUCTING PERSONS IN ADVANCE RESPECTING REDUCTION AUTHORIZED ON THE CERTIFICATE PLAN.

A reduction of fare and three-fifths on the certificate plan from points in New York State has been secured for persons attending the meeting of The Medical Society of New York, Albany, N. Y., April 15th-18th.

The following directions are submitted for your guidance:

1. Tickets at the regular full one-way first-class fare for the going journey may be secured within three days (exclusive of Sunday) prior to and during the first two days of the meeting. The announced opening date of the meeting is April 15th and the closing date is April 18th, consequently you can obtain your going ticket and certificate not earlier than April 11th nor later than April 17th.* Be sure that, when purchasing your going ticket you request a certificate. *Do not make the mistake of asking for a receipt.*

2. Present yourself at the railroad station for ticket and certificate at least thirty minutes before departure of train on which you will begin your journey.

3. *Certificates are not kept at all stations.* If you inquire at your home station, you can ascertain whether certificates and through tickets can be obtained to place of meeting. If not obtainable at your home station, the agent will inform you at what station they can be obtained. You can, in such case, purchase a local ticket thence, and there purchase through ticket and secure certificate to place of meeting.

4. Immediately on your arrival at the meeting present your certificate to the endorsing officer, Dr. William J. Nellis, at Bureau of Information, City Hall.

5. It has been arranged that the Special Agent of the Trunk Line Association will be in attendance on April 16th, 17th and 18th, from 9 A. M. to 6 P. M., to validate certificates. *A fee of 25 cents will be charged at the meeting for each certificate validated.* If you arrive at the meeting and leave for home again prior to the Special Agent's arrival, or if you arrive at the meeting later than April 18th, after the Special Agent has left, you cannot have your certificate validated and consequently you will not get the benefit of the reduction on the home journey. *No refund of fare will be made on account of failure to have certificate validated.*

6. So as to prevent disappointment, it must be understood that the reduction on the return journey is not guaranteed, but is contingent on an attendance at the meeting of not less than 100 persons holding regularly issued certificates obtained from ticket agents at starting points, showing payment of regular full one-way first-class fare of not less than 75 cents on going journey.

7. If the necessary minimum of 100 certificates are presented to the Special Agent, and your certificate is duly validated, you will be entitled up to and including April 22d to a continuous passage ticket by the same route over which you made the going journey, at three-fifths of the regular one-way first-class fare to the point at which your certificate was issued.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF ERIE

REGULAR MEETING, FEBRUARY 19, 1912.
BUSINESS SESSION.

Meeting called to order by President McKee, in the Buffalo Library Building.

On motion, the action of the Society in regard to amendment to by-laws concerning "contract work" was reconsidered, and the entire subject matter referred to the Committee on Contract Work.

A committee composed of William H. Thornton, Chairman, and Drs. F. W. Filsinger, E. L. Frost, H. K. DeGroat, Treasurer A. T. Lytle and President T. H. McKee, was appointed to consider the establishment of a collection department for the Society for the purpose of collecting bad accounts.

A memorial on the death of Dr. James S. Smith was presented by the Committee on Necrology and spread upon the Minutes.

SCIENTIFIC SESSION.

"Hemorrhage and Its Treatment," F. C. Busch, M.D., Buffalo.

"General Conditions in the Treatment of Surgical Tuberculosis with Tuberculin," Norman K. MacLeod, M.D., Buffalo.

"The Pictorial Accessory Cavities" (illustrated by stereopticon), George F. Cott, M.D., Buffalo.

MEDICAL SOCIETY OF THE COUNTY OF ALBANY

REGULAR MEETING, FEBRUARY 13, 1912.

At the business session one new member was elected.

SCIENTIFIC SESSION.

SYMPOSIUM ON INTESTINES.

"Anatomy," J. D. Craig, M.D., Albany.

"Pathology," W. D. Ayer, M.D.

"Symptoms and Diagnosis," T. F. Droescher, M.D., Albany.

"Treatment," Andrew MacFarlane, M.D., Albany.

"Surgery," A. H. Traver, M.D., Albany.

LEGISLATIVE NOTES.

The Assembly concurred in the adverse report from the Committee on Ways and Means on the Barnes Bill, Int. No. 211 and Printed No. 212. The Assembly also concurred in the adverse report from the Committee on General Laws of the Brooks Bill, Int. and Printed Nos. 58.

The Medical Society of the State of New York was represented at the hearing on the Barnes Bill by Drs. Bush and Neff of the Committee on Legislation, Drs. Ewing and Park of the Committee on Experimental Medicine and Dr. Lee, Professor of Physiology of Columbia University and Dr. Carrel of the Rockefeller Institute. At the hearing on the Brooks Bill the Medical Society was represented by Drs. Bush and Neff of the Committee on Legislation, Dr. Park of the Committee on Experimental Medicine and Dr. Lee, Professor of Physiology of Columbia University, Dr. Rous of the Rockefeller Institute and Dr. T. Wood Clarke, Treasurer of the Medical Society of the County of Oneida.

No action has yet been taken on the Bayne Bill in the Senate which is the same as the Barnes Bill which was defeated in the Assembly, nor on the Burd Bill which is the same as the Brooks Bill which was also defeated in the Assembly.

On February 19th, Mr. Barnes introduced the following bill into the Assembly, Int. No. 768, Printed No. 825, which was referred to the Committee on Codes:

AN ACT to amend section one hundred and eighty-five of article sixteen of chapter eighty-eight of the penal laws of the State of New York.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1.—Section one hundred and eighty-five of article sixteen of chapter eighty-eight of the penal laws of the State of New York, passed in the year nineteen hundred and nine, entitled "An Act providing for the punishment of crime, constituting chapter forty of the consolidated laws," is hereby amended so as to read as follows:

185. Overdriving, torturing and injuring animals; failing to provide proper sustenance. A person who overdrives, overloads, tortures or cruelly beats or unjustifiably injures, maims, mutilates or kills any animal, whether wild or tame, and whether belonging to himself or to another, or deprives any animal of necessary sustenance, food or drink, or neglects or refuses to furnish it such sustenance or drink, or causes, procures or permits any animal to be overdriven, overloaded, tortured, cruelly beaten, or unjustifiably injured, maimed, mutilated or killed, or to be deprived of necessary food or drink, or who wilfully sets on foot, instigates, engages

in, or in any way furthers any act of cruelty to any animal, or any act tending to produce such cruelty, is guilty of a misdemeanor.

(Nothing herein contained shall be construed to prohibit or interfere with any properly conducted scientific experiments or investigations, which experiments shall be performed only under the authority of the faculty of some regularly incorporated medical college or university of this state.)

A person who performs or assists in performing upon a living vertebrate animal any experiment not intended for the benefit of such animal but involving its cutting or mutilation, if such experiment is calculated to produce suffering, is guilty of a misdemeanor under the provisions of this Act unless such experiment is performed in accordance with each and every of the following provisions:

1. Such experiments shall be performed only by persons authorized to perform the same by certificates in writing issued by a medical college or laboratory incorporated under the laws of this state.

2. Every such experiment must be wholly performed while the animal is sufficiently under the influence of a general anæsthetic to prevent suffering, except in cases where the use of any anæsthetic will defeat the object of the experiment; but in any case the animal if seriously injured must be painlessly killed as soon as the experiment is concluded and an opportunity afforded to determine its result.

3. The substance known as "urari" or "curare" shall not for the purposes of this Act be deemed an anæsthetic.

4. Experiments performed for the purposes of instruction or for the demonstration of facts already proven must always be performed while the animal is sufficiently under the influence of a general anæsthetic to prevent suffering, and the animal must be painlessly killed after the operation is concluded if it has been seriously injured thereby.

5. Inoculation experiments for scientific purposes when conducted in good faith by persons whose competency to perform the same is proven by certificates in writing issued by a medical college or laboratory incorporated under the laws of this state shall not be deemed a violation of this Act.

BILLS INTRODUCED INTO THE LEGISLATURE.

January 31 to February 23, 1912.

IN ASSEMBLY.

Adding a new section 22-A to the Public Health Law requiring that where a person dies within six months after the injection or use of vaccine or antitoxin, the death certificate must state the fact of such use and requiring statistics of such deaths by local health boards. By Mr. Ahearn. To Public Health Committee. Printed No. 399. Int. No. 387.

Amending section 671 of the Greater New York charter by providing that the Commissioner of Charities shall provide wards for the examination of insane persons for the entire city, and prison wards in a city hospital in each borough, which shall be under constant police surveillance for the treatment of prisoners awaiting arrangement, trial or sentence, who are seriously injured or dangerously ill. By Mr. Lent. To Cities Committee. Printed No. 426. Int. No. 414.

Appropriating \$110,000 for constructing an extension to the power house at Kings Park State Hospital and \$12,000 for an extension to the cold storage building at the Manhattan State Hospital. (Same as S. 328). By Mr. Whitney. To Ways and Means Committee. Printed No. 459. Int. No. 447.

Amending section 1241 of the Greater New York charter by increasing from 10 to 25 years the period after birth within which the application must be made for registration of births not previously recorded, as provided in the section. By Mr. Brooks. To Cities Committee. Printed No. 483. Int. No. 471.

Repealing sections 270 to 282 of the Public Health

Law which provides for the regulation of chiropody. By Mr. Lent. To Public Health Committee. Printed No. 503. Int. No. 491.

Repealing section 692 of the Greater New York charter relative to Bellevue and allied hospitals and inserting 14 new sections, 1566 to 1569-J, creating a department of public hospitals, under a board of trustees of nine persons, including the commissioner of public charities, two of whom must be women, to have charge of all public hospitals in the city after February 1, 1913. By Mr. Cuvillier. To Cities Committee. Printed No. 512. Int. No. 500.

Appropriating \$15,000 in addition to \$12,600 appropriated in 1911, for deportation of alien and non-resident lunatics, and \$1,000 for office expenses of the State Board of Alienists. By Mr. Whitney. To Ways and Means Committee. (Same as S. 383). Printed No. 550. Int. No. 528.

Appropriating \$759,100 and reappropriating \$48,280 for State prisons, State Farm for Women and Matteawan and Dannemora State hospitals. By Mr. Coffey. To Ways and Means Committee. Printed No. 579. Int. No. 556.

Amending section 198 of the Public Health Law by providing that the State Regents may issue a dentist's license, without examination, to a person licensed to practice in another state in which the requirements for a license are not lower in this state and where such state similarly issues its license to duly licensed persons from this state. By Mr. Crane. To Public Health Committee. Printed No. 621. Int. No. 600.

Adding a new section, 312-A to the Public Health Law relative to hotels by requiring that each bed or bunk used for guests shall have two sheets, the upper to be at least nine feet long and folded back at the head over the quilts, so as to minimize the danger of inhaling bacteria from the upper coverings; requiring that lavatories be furnished with individual towels, and prohibiting towels for common use. Violation is made a misdemeanor. By Mr. Phillips. To Public Health Committee. Printed No. 637. Int. No. 612.

Adding a new section, 392-A, to the General Business Law, and a new section, 444, to the Penal Law, requiring all mattresses sold or offered for sale to be labeled with a statement of the quantity and nature of materials used in its manufacture, and making it a misdemeanor to use any material which has been used in a mattress, pillow or bed in a hospital or by a person with an infectious or contagious disease and prescribing penalties for violation. By Mr. Whitney. To General Laws Committee. Printed No. 640. Int. No. 615.

Amending subdivision 1, section 180, of the County Law, by providing that the board of supervisors of a county containing less than 100,000 inhabitants and having more than one coroner, may after January of any year reduce the number of coroners to not less than one, and may fix the terms of coroners thereafter elected. (Same as S. 402). By Mr. Grace. To Internal Affairs Committee. Printed No. 656. Int. No. 629.

Appropriating \$115,000 for the purchase of a new site for the Utica State Hospital, comprising approximately 1,000 acres of land, at such point as the State Lunacy Commission may determine. (Same as S. 396). By Mr. Cross. To Ways and Means Committee. Printed No. 659. Int. No. 632.

Amending subdivision 5, section 693 of the Greater New York charter so as to provide that the hospital and industrial colony for inebriates shall not be located within the town of Smithtown, Suffolk County. (Same as S. 437). By Mr. Thompson. To Cities Committee. Printed No. 665. Int. No. 638.

Adding eight new sections, 283 to 289-A, to the Public Health Law providing for the licensing and regulation of laundries by the Department of Health. The license fee is \$25. All laundries must be kept clean and be well ventilated. Wash room floors must be constructed of stone, asphalt, cement or similar material and properly

drained. No apartment of a laundry may be used for general living purposes. Persons with consumption or communicable skin diseases may not work in laundries. By Mr. Brooks. To Public Health Committee. Printed No. 689. Int. No. 651.

Adding nine new sections, 283-285, 285-A, 286, 287, 287-A, 288 and 289, to the Public Health Law, providing for the appointment of a state board of barber examiners who shall adopt rules prescribing sanitary requirements for all barber shops, subject to the approval of the State Board of Health, and shall conduct examinations and license applicants to practice as barbers, upon payment of a fee of \$5.00. The Board may appoint fifteen deputies at \$4.00 a day. (Same as S. 429). By Mr. Rahl. To Public Health Committees. Printed No. 699. Int. No. 661.

Repealing section 19 of the Insanity Law by abolishing the State Board of Alienists, and transferring their powers and duties to the health officer of the port of New York. By Mr. Walker. To Public Health Committee. Printed No. 709. Int. No. 671.

Amending chapter 192, Laws of 1895, by increasing from \$10 to \$25 the fee for a license to practice midwifery in Niagara County, and relative to the appointment and term of office of the members of the board of examiners of midwifery in the county, and legalizing acts of the board. By Mr. Brong. To Public Health Committee. Printed No. 742. Int. No. 698.

Amending chapter 115, Laws of 1900, by authorizing the city of Buffalo to expend \$300,000 for a municipal tuberculosis hospital and providing that the bonds therefor shall bear interest at four and one-half per cent., per annum instead of four per cent., as at present. (Same as S. 433). By Mr. Horton. To Cities Committee. Printed No. 749. Int. No. 705.

Amending chapter 646, Laws of 1905, which provides for the construction of a sanitary trunk sewer in Westchester County, by increasing from \$3,000,000 to \$5,000,000 the amount of bonds which may be issued therefor, and requiring the commissioners appointed in 1911 to prepare a map showing the lands included within the sewage area, and providing for a change in the line of the sewer should the commissioners deem it necessary to overcome the difficulties in carrying out the improvement. (Same as S. 511). By Mr. Madden. To Internal Affairs Committee. Printed No. 752. Int. No. 708.

Amending section 219 of the Public Health Law by providing that any applicant for a license to practice veterinary medicine whose registration is not legal, or who is not registered because of some error, shall submit to the state veterinary examiners or the state regents, proof that he was entitled to be legally registered. If he receives a certificate, his registration shall be deemed to have been valid from the date on which he should have registered. By Mr. Cheney. To Public Health Committee. Printed No. 790. Int. No. 734.

Amending section 73 of the Tenement House Law by striking out subdivision 3 which permits the occupancy of a room for living purposes although it does not comply with the Tenement House Law, where it is located on the top floor, opening upon an air shaft of less than twenty square feet or closed at the top, but with sufficient light and ventilation; enlarging the discretionary powers of the tenement house commissioner and making other provisions. By Mr. Shlivek. To Cities Committee. Printed No. 807. Int. No. 751.

Adding a new section, 139-C, to the General Municipal Law, providing that no inebriate hospital or similar institution shall be established in a town outside of the city or municipality for which it is created, and no property acquired therefor, without the consent of the town board by resolution. (Same as S. 500). By Mr. Thompson. To General Laws Committee. Printed No. 812. Int. No. 756.

Amending section 185 of the Penal Law by making experimentation upon living animals not intended for the benefit of the animals a misdemeanor unless conducted by a person authorized by a certificate from an

incorporated medical college or laboratory, prohibiting the use of urari or curari in such experimentation and otherwise regulating the same. By Mr. Barnes. To Codes Committee. Printed No. 825. Int. No. 768.

Amending section 2 of chapter 26, Laws of 1910, as amended by chapter 405, Laws of 1910, by providing that admission to the municipal tuberculosis hospital at Buffalo shall be in the order of the filing of applications except that the board of trustees may certify that the public health requires the admission in a different order, and making other provisions. (Same as S. 527). By Mr. Page. To Cities Committee. Printed No. 827. Int. No. 770.

Adding a new subdivision 3 to section 30 of the Poor Law, providing that in counties where no county hospital for the treatment of tuberculosis has been established, the supervisor of any town or ward may send any indigent person suffering from tuberculosis to any tuberculosis hospital in the county or an adjoining county at the expense of the county, not exceeding \$1.00 a day upon proper medical certificate as to the patient's need for the treatment. (Same as S. 581). By Mr. Chanler. To Internal Affairs Committee. Printed No. 869. Int. No. 808.

Repealing sections 310 and 311 of the Public Health Law which requires the vaccination of school children. By Mr. Cheney. To Public Health Committee. Printed No. 952. Int. No. 864.

Adding three new sections 285, 286 and 287 to the Public Health Law, authorizing the State Regents to license and provide regulations for the regulation of the practice of midwifery. The licence fee is fixed at \$10.00. By Mr. Greenberg. To Public Health Committee. Printed No. 959. Int. No. 871.

Adding a new section 318 to the Public Health Law, providing that all mattresses shall be labeled showing the nature and quantity of materials used in their manufacture, prohibiting the use in mattresses of materials previously used by or about hospitals, or persons with infectious diseases. Violation is a misdemeanor. By Mr. Hoff. To Public Health Committee. Printed No. 1029. Int. No. 932.

IN SENATE.

Amending section 19 and adding a new section 118, to the Ogdensburg Incorporation Act, authorizing the Board of Health to adopt a sanitary code to be approved by a majority vote of the common council. By Mr. Coats. To Cities Committee. February 22. Reported Amended. Printed Nos. 158, 645. Int. No. 155. (Same as A. 186).

Adding a new subdivision 3 to section 395 of the Greater New York charter, providing for the construction of private sewers in districts where the resident population does not average 100 or more persons to the ordinary city block. By Mr. Harte. To Cities Committee. February 22. Reported. Printed No. 219. Int. No. 216. (Same as A. 257).

Authorizing the Governor to appoint a commission of seven members, three of whom shall be known to favor unrestricted vivisection, three to be opposed to unrestricted vivisection, and the remaining member to be known to be impartial, for the purpose of investigating the present condition and extent of the practice of vivisection in this state, and report what changes, if any, are desirable, in existing laws, and appropriating \$5,000. By Mr. Bayne. To Finance Committee. Printed No. 236. Int. No. 231. (Same as 211).

Appropriating \$110,000 for constructing an extension to the power house at Kings Park State Hospital, and \$12,000 for an extension to the cold storage building at the Manhattan State Hospital. By Mr. Frawley. To Finance Committee. Printed No. 344. Int. No. 328. (Same as A. 447).

Erecting the Niagara Frontier Sewerage district and appointing a commission in the district, to stop pollution of the Niagara River by the discharge of sewage and manufacturing wastes. By Mr. Rampserger. To Judiciary Committee. Printed No. 377. Int. No. 361. (Same as A. 640).

Appropriating \$15,000 in addition to \$12,600 appropriated in 1911, for deportation of alien and non-resident lunatics, and \$1,000 for office expenses for the state board of alienists. By Mr. Frawley. To Finance Committee. February 21. Reported. Printed No. 398. Int. No. 383. (Same as A. 528).

Appropriating \$115,000 for the purchase of a new site for the Utica State Hospital, comprising approximately 1,000 acres of land, at such point as the State Lunacy Commission may determine. By Mr. Ferris. To Finance Committee. Printed No. 413. Int. No. 396. (Same as A. 632).

Amending chapter 115, Laws of 1909, by authorizing the City of Buffalo to expend \$300,000 for a municipal tuberculosis hospital, and providing that the bonds therefor shall bear interest at four and one-half per cent. per annum instead of four per cent., as at present. By Mr. Burd. To Cities Committee. Printed Nos. 450-646. Int. No. 433. (Same as A. 705).

Amending subdivision 5, section 693, of the Greater New York charter so as to provide that the hospital and industrial colony for inebriates must not be located within the town of Smithtown, Suffolk County. By Mr. Long. To Cities Committee. Printed No. 454. Int. No. 437. (Same as A. 638).

Repealing chapter 115, Laws of 1896, and chapter 346, Laws of 1898, and amending chapter 220, Laws of 1866, by authorizing the board of trustees of the village of Saratoga Springs to appropriate to any hospital in the village, maintaining a free dispensary and under the supervision of the State Charities Board, such sums annually as may be deemed proper, not to exceed \$3,500 a year. By Mr. Brackett. To Villages Committee. Printed No. 549. Int. No. 518.

Adding a new section 718 to the Greater New York charter, authorizing the commissioner of charities to appoint a resident physician at the workhouse from the civil service list, who shall receive \$3,000 a year. By Mr. McManus. To Cities Committee. Printed No. 631. Int. No. 594. (Same as A. 415).

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

HEALTH AND MEDICAL INSPECTION OF SCHOOL CHILDREN. By WALTER S. CORNELL, M.D., Director of Medical Inspection of Public Schools, Philadelphia; Lecturer on Child Hygiene, University of Pennsylvania; Director of Division of Medical Research, New Jersey Training School for the Feeble-Minded, etc. Illustrated with 200 half-tone and line engravings, many of them original. Philadelphia. F. A. Davis Company, Publishers. 1912.

TWENTY-EIGHTH ANNUAL REPORT of the State Board of Health of the State of Rhode Island for the year ending December 31, 1905, and including the report upon the registration of births, marriages and deaths in 1904. Providence. E. L. Freeman Company, State printers. 1911.

THE PHYSIOLOGY OF FAITH AND FEAR, or THE MIND IN HEALTH AND DISEASE. By WILLIAM S. SADLER, M.D., Professor of Physiologic Therapeutics, The Post-Graduate Medical School of Chicago; Director of the Chicago Institute of Physiologic Therapeutics; Member of the Illinois State Medical Society; The American Medical Association; The American Association for the Advancement of Science, etc. Author of "The Science of Living," or "The Art of Keeping Well," "The Cause and Cure of Colds," etc. Illustrated. Chicago. A. C. McClurg & Co., 1912.

DISEASES OF THE NOSE AND THROAT. Comprising affections of the trachea and œsophagus. A textbook for students and practitioners. By ST. CLAIR THOMSON, M.D., F.R.C.P. (Lond.), F.R.C.S. (Eng.). Physician for diseases of the throat and Professor of Laryngology in King's College Hospital; Physician to King Edward VII. Sanatorium; formerly physician to the Throat Hospital, Golden Square; Surgeon for Diseases of the Throat and Ear to the Seaman's Hospital, Greenwich; and Surgeon to the Royal Ear Hospital, London. With 18 plates and 294 figures in the text. New York. D. Appleton and Company, 1912.

UROLOGY. The Diseases of the urinary tract in men and women. A book for practitioners and students. By RAMON GUIERAS, M.D. (Harv.). Professor of Genito-Urinary Surgery, New York Post-Graduate Medical School; visiting surgeon to the Columbus and Post-Graduate Hospitals; consulting surgeon to the City and French Hospitals; formerly Professor of Anatomy, Operative Surgery and Gynecology, Post-Graduate Medical School, and visiting surgeon in the Department of Genito-Urinary Diseases and Gynecology, New York City Hospital; Member of the American Medical Association, the American Urological Association, the French Urological Association, the American Public Health Association, the American Association of Genito-Urinary Surgeons, the American Association of Obstetricians and Gynecologists, the Association of Military Surgeons of the United States, the American Society of Tropical Medicine, the New York Academy of Medicine and the Harvard Medical Society. With 943 illustrations in text and seven plates. Vol. I. New York and London. D. Appleton and Company, 1912.

UROLOGY. Volume II. By RAMON GUIERAS. With 943 illustrations in text and seven plates. New York and London. D. Appleton and Company, 1912.

A TREATISE ON TUMORS. For the use of physicians and Surgeons. By ARTHUR E. HERTZLER, M.D., of Kansas City, Mo., Assistant Professor of Surgery in the University of Kansas. Octavo, 728 pages, with 538 illustrations and 8 plates. Cloth, \$7.00, net; half Persian morocco, gilt top, de luxe, \$9.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

MODERN METHODS IN NURSING. By GEORGIANA J. SANDERS, formerly Superintendent of Nurses at the Massachusetts General Hospital, Boston. 12 mo., of 881 pages, with 228 illustrations. Philadelphia and London. W. B. Saunders Company, 1912. Cloth, \$2.50, net.

TUMORS OF THE JAWS. By CHARLES L. SCUDDER, M.D., Surgeon to the Massachusetts General Hospital. Octavo of 391 pages, with 353 illustrations, 6 in colors. Philadelphia and London. W. B. Saunders Company, 1912. Cloth, \$6.00, net; half morocco, \$7.50, net.

A. MANUAL OF PATHOLOGY. By GUTHRIE MCCONNELL, M.D., Professor of Pathology and Bacteriology, Medical Department, Temple University, Assistant Pathologist to the Philadelphia City Hospital, formerly Pathologist to the St. Louis Skin and Cancer Hospital and Bacteriologist to the Missouri State Board of Health. Illustrated. Second edition, thoroughly revised. Philadelphia and London. W. B. Saunders Company. 1911. Price, flexible leather, \$2.50 net.

CURRENTS OF HIGH POTENTIAL OF HIGH AND OTHER FREQUENCIES. Second edition. By WILLIAM BENHAM SNOW, M.D., author of "A Manual of Electro-Static Modes of Application, Therapeutics, Radiography, and Radiotherapy," "Therapeutics of Radiant Light and Heat and Convective Heat," Editor of the *Journal of Advanced Therapeutics*, late instructor in Electro-Therapeutics in the New York Post-Graduate School and Hospital, etc.

PRACTICAL TREATMENT. Volume III. A Handbook of Practical Treatment. On three volumes. By 82 eminent specialists. Edited by John H. Musser, M.D. Professor of Clinical Medicine, University of Pennsylvania; and A. O. J. Kelly, M.D. Late Assistant Professor of Medicine, University of Pennsylvania. Volume III: Octavo of 1095 Pages, illustrated. Philadelphia and London; W. B. Saunders Company, 1912. Per volume: Cloth, \$6.00 net; Half morocco, \$7.50 net.

BOOK REVIEWS.

PLASTIC AND COSMETIC SURGERY. By FREDERICK STRANGE KOLLE, M.D., Fellow; New York Academy of Medicine; Member of Deutsche Medizinische Gesellschaft, New York; Kings County Hospital Alumni Society. With one colored plate and 522 illustrations in text. D. Appleton & Company. New York and London. 1911. Price, \$5.00 in cloth and \$6.00 in half leather.

Dr. Kolle's book fills a distinct place in surgical text books. It is a practical treatise which brings together in accessible form the information which has heretofore been widely scattered.

The opening chapter is devoted to the history of the subject. The chapters on the general principles of surgery and surgical technic are not as good as can be found in most works on general surgery. The incisions for plastic work are admirably presented.

Plastic operations about the eyes, upon the ears, nose, lips, face and neck are well described. The description of rhinoplastic operations is full. All of the operations of value for hare-lip are given. The descriptions of operations on the ear are admirable.

The most commendable section is that dealing with paraffin prosthesis. This is full, not only in its technique, but also in its discussion of contraindications and dangers. Means for promoting onward results are given. The surgeon can find in this section information on all of the cosmetic uses of paraffin injections.

Electrolysis in dermatology is discussed. The author has neglected no feature of the work. Case recording is described.

The general surgeon who desires to look up some plastic cosmetic method may turn to this book with the expectation of finding what he seeks. J. P. W

THE MODERN MATERIA MEDICA. The Source. Chemical and Physical Properties, Therapeutic Action, Dosage, Antidotes and Incompatibles of all additions to the newer Materia Medica that are likely to be called for on prescriptions, together with the name and address of the manufacturer or proprietor, and in case of foreign articles, of the American agent. Second Edition, revised and enlarged. New York. The Druggists' Circular, 1911: 432 pages. Cloth, \$1.25.

An invaluable little book for the pharmacists, giving an alphabetical list of the hundreds of new therapeutic agents introduced and advertised yearly, some meritorious and of permanent interest, others of but passing importance. An extensive cross-indexing under synonyms makes easy the task of finding seldom heard of preparations which are occasionally prescribed. The physician will find the book useful on account of the information it contains relative to doses and incompatibilities and of the insight given into the real worth of the various medicaments; also on account of the knowledge imparted as to the make-up of remedies advertised under trade names.

A MANUAL OF FEVERS. By CLAUDE BUCHANAN KER, M.D., F.R.C.P., Medical Superintendent, City Hospital, Edinburgh, etc. London, Henry Frowde, 1911, pp. 314.

As the author indicates in his brief preface this little book is intended primarily for the instruction of those

who propose to take the statutory course of fevers in an isolation hospital and naturally is primarily of value as a text-book for English students. The reviewer has, however, found considerable help in renewing his acquaintance with the exanthemata from glancing through its pages, for it contains in concise, forceful and well-arranged paragraphs very complete information on all of the eruptive fevers, as well as typhoid, diphtheria, cerebro-spinal meningitis, erysipelas and the other infantile contagious diseases.

Typhoid vaccination and vaccine treatment are mentioned briefly. With regard to preventive vaccination, the author speaks with conviction as to its value; he considers it inadvisable, however, to vaccinate during an epidemic "as there is some reason to believe that during the negative phase set up by the first injection the patient is more susceptible than before the infection." His statements regarding serum and vaccine treatment are much less categorical, though he seems to think that the death rate is less where this treatment is employed.

A word should be said regarding the plates which, for photographic reproductions, are peculiarly clear and illuminating, conveying a better picture of the eruptions than many colored illustrations. Altogether this little book deserves entire commendation.

HENRY GOODWIN WEBSTER.

INTRODUCTION TO PRACTICAL ORGANIC CHEMISTRY, including Qualitative and Quantitative Analysis and Preparations. By A. M. KELLAS, B.Sc., Ph.D. Lecturer on Chemistry at the Middlesex Hospital Medical School. London. Oxford. University Press, 1910.

This book of 204 pages is a laboratory manual for students of organic chemistry. It contains a description of the ordinary laboratory operations followed by applications of these operations to the preparation of typical organic compounds. The selection of processes seem to be judicious and the directions are brief and intelligible, although there are some errors which seem to indicate a lack of care in proof reading. The analytical schemes are limited to certain substances embraced in the syllabi of the Board of Education of Great Britain, and of London University, Cambridge, Oxford and the Welsh Universities. The book, therefore, has a specific, rather than a general aim, *i. e.* to cover the courses in these universities. It is not to be recommended as a suitable textbook in the average medical school.

E. H. B.

DISEASES OF THE EAR, NOSE AND THROAT. By HENRY OTTRIDGE REIK, M.D. Asso. in Ophthalmology, Johns Hopkins University and Surgeon in the Baltimore Eye, Ear and Throat Hospital, assisted by A. J. Neilson Reik, M.D., Surgeon Baltimore Eye, Ear and Throat Hospital. With 81 illustrations and 2 colored inserts. D. Appleton and Company. New York and London, 1911.

This volume presents in a clear and concise manner, the diseases of the ear, nose and throat, and is written expressly for the benefit of the family physician and the under-graduate medical student.

In each chapter and subject much care has been expended to show the family physician how far it is safe and advisable for him to proceed in the care and treatment of diseases of the ear, nose and throat; and at just what points in these different diseases it is proper for him to ask the aid of one especially equipped to treat such cases. The author advocates such procedure on the ground of justice to the patient and for the protection of the family physician.

The chapters mentioning the general diseases in which ear, nose and throat complications are liable to occur, are excellent for their conciseness and brevity and constitute in themselves a valuable aid to the busy family physician, who, at a glance can refresh his memory as to the conditions for which he must watch and guard against.

The book is well supplied with illustrations which,

in conjunction with the text, are invaluable aids to the study of the subject.

This manual is an interesting and instructive volume, besides being an exceedingly practical one and is admirably adapted for the uses which its author sets forth in his preface.

W. S. S.

DISEASES OF THE DIGESTIVE CANAL. By DR. PAUL COHNHEIM. Specialist in Diseases of the Stomach and Intestines, in Berlin. From the second German edition. Edited and translated by DUDLEY FULTON, M.D., Assistant Professor of Principles and Practice of Medicine, University of California College of Medicine, Los Angeles Department; Attending Physician, Los Angeles County Hospital.

In general style this issue resembles the previous edition. Page 4, Sec. 8, the color of the stools should be included. Page 20; most authorities would disagree with the statement that the appendix is quite readily palpable.

In describing the stomach the point is once more well emphasized that a tube open at its distal end, should NOT be used. Again on p. 45; "For therapeutic purposes, the stomach-tube is rarely used at the present time." This is sound judgment, and should be heeded.

The chapter on Skiagraphy is timely, inasmuch as at the present there is no more potent factor in alimentary diagnosis than the X-ray; the fluoroscopic examination, of course being the most desirable. P. 58: Gastrotomy brings much relief in more than the *very rare* cases. P. 80: It is refreshing to see it maintained that the splashing sound, *per se*, has no pathological significance. P. 82: It seems strange that even yet, assertion is made that "a large majority" of stomach affections are functional, when daily evidence, almost universal, points to the opposite conclusion. P. 84: It would seem as though we had a sufficient number of medical terms without the one "epigastralgia."

On the following page, examination of the urine should include that for Indican. The next paragraph gives an admirable description of the coated tongue.

Under gastric ulcer, the method of treatment employed, and successfully, by Lehnartz and his followers, deserves mention. Erosions might have taken up less space. Hyperchlorhydria, as such, is daily becoming of less diagnostic value.

It might be possible to lay too much stress upon "Habitus Enteropticus," for in many cases, it is of little more real pathological value than the "splashing sound." Further on, "Anemic-Gastroptotic Dyspepsia" is one more appellation for the well-known condition of atony, which is confusing.

P. 220: "Heartburn or Pyrosis Hydrochlorica" is hardly correct as it has been pretty clearly shown that the Hcl is not responsible for the heartburn.

The absence of true pain except in organic disease is well brought out.

With regard to typhlitis-stercoralis and appendicitis, it would seem best, in the light of modern knowledge, which we owe largely to surgery, that the thing to be done in cases which appear to be on the "border line" between medicine and surgery; is to give the patient the benefit of operation, and take no chance. The grave dangers of procrastination are surely too well known. Here conservative treatment has a limited sphere of usefulness.

The plaster bandage is without doubt the best form of mechanical support in those cases of enteroptosis, in which support is needed: *viz.*, the thin and atonic patient.

In this connection, surgical intervention, with its advocated removal of portions of the colon, etc., should be mentioned.

Under intestinal stenosis, perhaps, a brief description of "Lane's Kink," just now in the limelight, might be in order.

The space devoted to constipation is well written and to the point, but, it can hardly be conceded that a "cure" takes place in "by far the majority of cases."

In the medical treatment, phenolphthalein ought to be enumerated.

On the whole the book is good reading and instructive, and the only adverse comment, if there be any, is that like many purely medical works, it advocates a trifle too much conservatism as to surgical intervention.

H. W. LINCOLN.

THE BLOOD AND ITS THIRD ANATOMICAL ELEMENT. By A. BECHAMP; translated by MONTAGUE R. LEVERSON, M.D. Publishers, Boericke & Tafel, Philadelphia.

The work is described on the title page as the "Application of the Microzymian theory of the living organization to the study of the anatomical and chemical constitution of the blood and to that of the anatomical and physiological causes of the phenomena of its coagulation and of its other spontaneous changes." It is a posthumous publication devoted to a detailed description of the author's research, a defence of his conclusions and an attack on Pasteur and others whose conclusions were at variance with those of Bechamp. The "Microbian Theory of Disease" is declared to be the "greatest scientific silliness of the age." A contemporary of Pasteur and working on the same biologic problems the author's book is an echo of the dissensions of that period, largely controversial in style and bitterly attacking both the accuracy and veracity of Pasteur. While neither convincing in argument nor dispassionate in tone it is interesting in the vehemence with which it handles the subjects contained.

T. H. D.

CLINICAL DIAGNOSIS. By CHARLES PHILLIPS EMERSON, A.B., M.D., Resident Physician, The Johns Hopkins Hospital, Associate in Medicine, The Johns Hopkins University. Third edition. J. B. Lippincott Company, Philadelphia, 1911. Octavo. 724 pages, 27 color and 126 black and white illustrations. Cloth, \$5.00.

Principles, as Plato reminds us, require constant revision and consideration. Emerson's book represents a revision to date of the principles of clinical diagnosis. It offers to the students of medicine, hospital internes and practitioners a valuable book describing the clinical examination of sputum, urine, blood, feces, gastric contents and other bodily fluids. In the explanation of the technique of laboratory methods, both as to their relative value of procedure and practical importance based on experimentation and clinical observation, details are well described which are often left to the imagination.

E. A. B.

A HANDBOOK OF MEDICAL DIAGNOSIS. By J. C. WILSON, A.M., M.D., third edition, thoroughly revised. PP. 1-1438. J. B. Lippincott Company. Philadelphia and London. Price, \$6.00.

The passing of this work to a third edition is sufficient proof of its value to the profession. Those who have not seen it may be reminded that it is divided into four parts. The first deals with medical diagnosis, the second with methods and their immediate results, the third with symptoms and signs, and the fourth with the clinical applications.

The author of this Handbook has been known for many years as a distinguished practitioner and teacher. He brings to his task a long and ripe clinical experience, whereby he is especially fitted to select from the great mass of methods and symptoms those which are, or promise to be, of permanent and real value. With such qualifications, well and wisely utilized, Dr. Wilson has produced a work on diagnosis second to none, and better than most of those which have appeared in the past few years.

This work was reviewed on its appearance. In the present edition one notes that the articles upon anterior poliomyelitis, pellagra, and beri-beri have been rewritten; also those upon typhus fever and relapsing fever. Descriptions of Mexican typhus (tabardillo), and Brill's disease, termed pseudo-typhus, have been added, as well as articles upon anaphylaxis and serum

disease. The electro-cardiograph receives a brief notice. The sections on diseases of the heart, stomach, and nervous system have undergone a considerable revision. It is thus evident that the book is distinctly up-to-date. This fact, and the general character, reliability, thoroughness, and clinical excellence, both of the book and its author, should give the volume ready access to a working library.

G. R. B.

DISEASES OF THE NOSE AND THROAT. Comprising affections of the trachea and oesophagus. A textbook for students and practitioners. By ST. CLAIR THOMSON, M.D., F.R.C.P. (Lond.), F.R.C.S. (Eng.). Physician for diseases of the throat and Professor of Laryngology in King's College Hospital; Physician to King Edward VII. Sanatorium; formerly physician to the Throat Hospital, Golden Square; Surgeon for Diseases of the Throat and Ear to the Seaman's Hospital, Greenwich; and Surgeon to the Royal Ear Hospital, London. With 18 plates and 294 figures in the text. New York. D. Appleton and Company, 1912. Price, \$7.50.

Whenever a man of St. Clair Thomson's experience and attainments in the realm of a specialty publishes a textbook "based on personal experience," the reader may expect not only to be guided into right channels regarding the details of pathology, symptoms and diagnosis but also to be the recipient of well elucidated details regarding all phases of treatment. Such are the characteristics of Thomson's excellent text book which is a clear and concise outline of the present status of the world's knowledge of affections of the nose and throat. The work contains sufficient anatomy and physiology to meet the requirements of the student and general practitioner, wisely eliminating such detailed and extensive descriptions of these departments as are elaborated by anatomists and physiologists. Much stress is laid upon the clinical and pathological features of the affections under consideration, and this alone adds interest and value to the book. His diction is graceful and the subject matter is presented in a style which might be expected from an experienced teacher. The steps of the various operations are well outlined and clearly defined. Many of the clinical hints which are evidently based upon the author's extensive experience are of great value and will be duly appreciated by those who have the good fortune to study this volume. The volume is profusely illustrated in a manner that serves well to portray the necessary steps of the operative procedures. We hesitate to criticise any department of this excellent work, but in the manner of illustrating, the drawings show a lack of prospective which is especially noticeable when compared with those of the trained artists who have illustrated the more recent American text-books. It may also be noted that the reproduced radiographs and the transillumination cut of the maxillary sinuses are more or less defective. These, however, are minor criticisms and detract but little from the general excellence of the book for which we predict a successful outcome.

W. C. P.

DEATHS.

SIDNEY S. GRABER, M.D., New York City, died February 8, 1912.

EDWIN R. MAXSON, M.D., Syracuse, died January 25, 1912.

RALPH M. MEAD, M.D., Brooklyn, died February 15, 1912.

JAMES S. SMITH, M.D., Buffalo, died January 30, 1912.

CHARLES H. TERRY, M.D., Brooklyn, died January 18, 1912.

LEONARD WEBER, M.D., New York City, died March 1, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

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EDITORIAL DEPARTMENT

THE DUTY OF THE PHYSICIAN TOWARD THE ANTIVIVISECTION MOVEMENT.

FOR the past five years the New York Antivivisection Society has been conducting a campaign in this state against medical progress. Its specific object is the limitation, if not the ultimate abolition, of experimentation upon animals, and it endeavors to obtain popular support for the restrictive bill which it annually brings before the legislature. It has made itself notorious by its methods, which consist in the spreading of false statements and false implications regarding the value of, and the methods employed in, animal experimentation. This misinformation is spread by means of printed circulars, through the agency of Mr. W. R. Bradshaw as the Society's lecturer, and by an exhibition of stuffed animals, falsely depicting laboratory procedures, which is shown at agricultural fairs. Mr. Bradshaw travels about the state and arranges to lecture in cities and villages. He endeavors to obtain local co-operation, especially through the granges. He attempts to prove that vivisection is conducted in an extremely cruel and immoral manner. He claims that the most destructive operations are constantly performed upon animals that are not under the influence of anæsthetics, and are keenly alive to their torture. He asserts that scientific men who experiment on animals consider that the animal has "no rights which man is called upon to notice or respect," and that "a man may put it to any amount of torture, however extreme or long continued, if it pleases him to do so." He intimates that experimental animals are "tortured to death to appease the appetites of these men for cruelty, more than any desire for scientific medical knowledge." He claims that bacteria are not

the cause of infectious diseases: that the Klebs-Loeffler bacillus is not the cause of diphtheria, nor the diplococcus intracellularis the cause of cerebro-spinal meningitis. He denounces serum therapy. He speaks of diphtheria antitoxin as "simply a fake that is used by the doctors as a kind of witches' broth of the twentieth century." He ridicules the ideas that it has permanently diminished the death rate of diphtheria, and that antimeningitis serum has diminished that of epidemic cerebro-spinal meningitis. He makes the astonishing claim that the discoverer of antimeningitis serum, Dr. Simon Flexner, the director of the Rockefeller Institute, himself admits that he has little, if any, confidence in the serum, and he speaks of Flexner as a "tin god," honored by a "crowd of camp followers, syncophants, and claquers."

These statements regarding Mr. Bradshaw's lecture, which are taken chiefly from stenographic reports of it, suffice to illustrate his utter misrepresentation of modern medicine, and his own unworthiness. At the close of his lecture, he is accustomed to present a resolution in favor of the antivivisection bill of the New York Antivivisection Society. He does not state that this bill has been ignominiously killed at each of the last five annual sessions of the legislature.

The Medical Society of the State of New York has repeatedly put itself on record against the pernicious activities of antivivisectionists, and for many years has maintained its Committee on Experimental Medicine for the express purpose of opposing such activities and all legislation interfering with animal experimentation by competent persons. The success which the Committee has achieved and the sane attitude taken by successive legislatures indicate that there is no real danger that the efforts of the antivivisectionists will

be successful, provided that the members of the medical profession throughout the state continue to exercise due diligence. The Committee feels that it is justified in asking for the intimate and active co-operation of all physicians. It urges every member of the county medical societies to feel an individual responsibility. All physicians are asked to communicate with the local granges and other bodies before which Mr. Bradshaw is likely to appear, making known his mendacious character and opposing his appearance by all legitimate means. Whenever antivivisection meetings are held, physicians are asked to attend them and oppose the development of local sentiment against animal experimentation. No locality should be allowed, because of misrepresentation of modern scientific medicine, to put itself on record by formal vote in favor of antivivisection legislation. Letters to the local newspapers are often of great value. Physicians are asked to use their influence in inducing the officers of agricultural fairs to prohibit the misleading antivivisection exhibitions. Especially is it desirable that medical men should continue to urge upon members of the legislature the unwisdom of, and the serious results that may follow from antivivisection legislation.

The Committee on Experimental Medicine will be glad to supply without cost literature regarding the methods and the value of animal experimentation, upon application to its office, 17 West 43d Street, New York City.

Committee on Experimental Medicine.

JOSEPH D. BRYANT, M.D., *Chairman*,
JOHN S. THACHER, M.D., *Secretary*.

THE VIVISECTION REPORT.

WE print below a précis of the Report of the Royal Commission on Vivisection from the London *Spectator*. If anything were needed to emphasize the appeal of the Committee on Experimental Medicine of the State Medical Society, it will be found in the column below. We call special attention to the paragraph dealing with the "harrowing descriptions and illustrations of operations" as "misleading and false." In face of such a scathing report Mr. Bradshaw, a professional and hired antivivisector will doubtless continue to promulgate his misinformation throughout the state. It would not be amiss if the committee were to reprint this paragraph and spread it broadcast wherever Mr. Bradshaw appears.

*The Report of the Royal Commission on Vivisection has been long delayed. It is just

* *The Spectator* (London), March 16, 1912.

four years, since the Commissioners ceased to hear evidence. Illness and death were among the causes of the delay. Science, meanwhile, went on: Flexner worked out the cause and the treatment of spotted fever, and the infective nature of infantile paralysis: Bruce advanced the work of bringing down the death rate from sleeping sickness in the Uganda Protectorate: Leishman reported the good results of antityphoid inoculation among our men in India; and, in the United States, Wood issued his Army Order, making this protection compulsory on every officer and man under forty-five, in the American army, who had not already suffered from the disease. France, not to be outdone by other nations, was able to show, in 1911, her record for 1910 of bitten cases treated at the Pasteur Institute in Paris: 401 cases without one death. England, by the work of her Hospitals under the Metropolitan Asylums Board, brought down the death rate in laryngeal diphtheria, by the use of diphtheria antitoxin, from 60 per cent. to 11.7 per cent. None of these facts was before the Commission, nor is mentioned in its final Report.

Happily, the Report is unanimous. As one of the Commissioners pointed out, on Tuesday night, in the House of Commons, there is no minority report. Of the ten Commissioners, two have died: Lord Selby, and Mr. Tomkinson, M.P. The remaining eight Commissioners all sign the Report. Three of them sign it with reservations, which they embody in memoranda. These memoranda do not affect the principles of the Report. The recommendations which are signed by all the Commissioners are all of them within the province of the Home Office. There is nothing, in any of them, which requires the intervention of Parliament.

Those of us who have carefully read the evidence given to the Commission, do not need to be told, that the opponents of all experiments on animals were well represented, both among the Commissioners and among the witnesses. They sent up to the Commission no less than eighteen witnesses, exclusive of the two representatives of the Society for the Prevention of Cruelty to Animals. One of the antivivisection societies sent up no less than six witnesses. Some of the eighteen witnesses were examined at very great length: one of them was under examination for three days and a half. It is certain, therefore, that the case against experiments on animals was carefully heard, and fully set forth.

The Report begins with a short account of previous legislation, and of the text and the administration of the Act. It is not easy for the Home Office, to adjust an Act 36 years old to the ever shifting and ever growing affairs of physiology and bacteriology. The Act began to be more or less behind the times, when it

was but a few years old: and the Home Office, from time to time, has to re-fashion the wording of this or that Certificate, to endorse its permits with special conditions, and so forth. The text of the Act, the bare bones of the Act, is nothing: the administration of the Act is everything. And all who have ever held a license and certificates under the Act are well aware, that the Home Office guards and watches the working of the Act with steady care against abuses.

The Report next refers to certain charges made by Mr. Coleridge against the Home Office; and makes it clear, that these charges were hardly worth Mr. Coleridge's great expense of time over them. Next, it deals with certain statements made by Miss Lind-af-Hageby, Mrs. Cook, Lieut.-Colonel Lawrie, and Mr. Graham. "After careful consideration of the above cases, we have come to the conclusion that the witnesses have either misapprehended or inaccurately described the facts of the experiments." The Commissioners affirm their belief in the good faith of the Home Office, and in the general loyalty and good faith of the licensees: they administer a sound rebuke to a certain physiologist, whose evidence deserved their censure: and they give a very good word of advice to the public, as follows:—

"WE DESIRE TO STATE THAT THE HARROWING DESCRIPTIONS AND ILLUSTRATIONS OF OPERATIONS INFLICTED ON ANIMALS, WHICH ARE FREELY CIRCULATED BY POST, ADVERTISEMENT, OR OTHERWISE, ARE IN MANY CASES CALCULATED TO MISLEAD THE PUBLIC, SO FAR AS THEY SUGGEST THAT THE ANIMALS IN QUESTION WERE NOT UNDER AN ANÆSTHETIC. TO REPRESENT THAT ANIMALS SUBJECTED TO EXPERIMENTS IN THIS COUNTRY ARE WANTONLY TORTURED WOULD, IN OUR OPINION, BE ABSOLUTELY FALSE."

The Commissioners then proceed to the general history of recent medical science, in relation to experiments on animals. They go over the familiar facts which we all know; the victories won or half-won over diphtheria, rabies, malaria, yellow fever, and other diseases: the blotting out of Malta fever, the preventive treatment against plague, lockjaw, and so forth; the work of Lister; these and the like blessings of the last thirty years. They do not omit to say, what great advantages have been given, by the help of experiments on animals, to the animal world. Anthrax, rinderpest, Texas cattle fever, glanders, swine erysipelas—these and other devastating diseases of the higher domestic animals are better understood, and better controlled, by methods learned through experiments on animals, than they were. It is certain, that our animals are the gainers by our experiments on animals: and it is a pity, that the Report says nothing of Nuttall's recent work on the cause and cure of malignant jaundice in dogs, nor of Cope-

man's recent work on the protective treatment of dogs against distemper.

The Commissioners then deal with the question, how far immunity from pain, in experiments on animals, is or can be secured. They recognize that anæsthetics can secure complete insensibility to pain: and they recognize that morphia, chloral, and the like drugs, in sufficiently heavy doses, are not mere narcotics but veritable anæsthetics. It is a matter of dosage. They go on to consider the pain involved in inoculations and similar procedures, which are 95 per cent. of all experiments on animals in this country. They say, very truly, that it is clear that in the large majority of these inoculations the animals do not appear to suffer pain: but they emphasize the fact that some inoculations do cause pain. The animals used for inoculation, in the vast majority of cases, are mice, rats, or guinea-pigs.

Coming to the point of view of ethics, the Commissioners are agreed "that experiments upon animals, adequately safeguarded by law faithfully administered, are morally justifiable, and should not be prohibited by legislation." Then, they make certain recommendations which they believe to be calculated to secure more effectually the objects aimed at by the Act. They recommend that there should be four whole-time Inspectors for Great Britain, instead of two Inspectors: this is only fair, seeing how the Inspectors' work is very much greater than it was at the time of the passing of the Act. They recommend special restriction of the use of curare: this is not important, because curare is so rarely used at all, and is never used except in conjunction with an anæsthetic.

Over this deliberate, moderate, and authoritative Report, signed by all the Commissioners, after eighteen months given to the hearing and publishing of 21,761 questions and answers, and after four years given to the business of agreeing together—over this final Report, let the extremists fight, if they feel fighting to be necessary.

LORD CROMER'S SATISFACTION.

In the course of a letter to *The Times* Lord Cromer, President of the Research Defence Society, states:—

I do not think that any impartial person will be able to read this illuminating Report without coming to the conclusion that, broadly speaking, the supporters of vivisection have proved their case. The charges brought by Mr. Stephen Coleridge against the Home Office have for the most part been unable to stand the test of cross-examination, whilst it has been clearly shown that the statements made by some of the more extreme antivivisectionists are either unfounded, exaggerated, or the result of misapprehension.

Original Articles

THE VALUE OF RADIOGRAPHY IN
THE DIAGNOSIS OF DISTURBANCES
OF THE GASTRO-INTESTINAL
TRACT.*

By ANDREW MacFARLANE, M.D.,

and

ARTHUR F. HOLDING, M.D.,

ALBANY, N. Y.

THERE is an old maxim that there are more false facts than false theories extant in the world. The probable truth of a theory can to a certain extent be judged by any logical mind, but as facts are either simply the experiences of senses liable to err or commonly and still worse are purely supposititious and speculative, their truthfulness or falsity is not so easily determinable.

The advance of medical science has been marked by the gradual accumulation of isolated facts corroborated by different observers. The correlation of a series of these facts has furnished the probable explanation of a morbid process and has removed that disease from the domain of the purely hypothetical.

No part of the human organism has suffered more from this supposititious knowledge than the gastro-intestinal tract. Pawlow and his students did much to clear away the fog surrounding the functions of the stomach and they have given such a simple and rational explanation of its actions that we marvel at its very simplicity.

The intestinal tract because it is mechanically more difficult to reach and because its functions are more complex has not shared in equal degree the full elucidation of its actions. The X-ray, which has proved of such inestimable value to the surgeon in the determination of fractures, dislocations, and the presence of foreign bodies; which has been of such great assistance to the internist in the diagnosis of aneurism, diseases of the heart and early tuberculosis, seems likely to gain still more marked triumphs and to be of even greater value in the field of gastro-intestinal diagnosis.

It is to this latter phase that we wish to call your attention. Possibly a very brief and superficial review of the form and functions of the gastro-intestinal tract may be of value in refreshing your memory.

The gastro-intestinal canal is thirty feet long. Food, after more or less mastication and admixture with the saliva which begins the digestion of the starches by its enzyme, ptyalin, passes into the œsophagus, a tube nine to ten inches in length, and is then carried down into the stomach by the peristalsis of the musculature—the circular fibres constricting from above downwards

while the longitudinal fibres contract and thus dilate the tube in advance.

Liquid food passes through the entire length of the œsophagus in a tenth of a second, while solid and semi-solid food take six seconds.

There are three normal constrictions—at the beginning, about half way down and the most marked at the cardia where the circular muscular fibres form a sphincter. As a result, half the entire time is taken in the passage through the cardia into the stomach.

The stomach is contained in the left of the abdomen which is the only large cavity of the body bounded by muscles and fasciæ and which, therefore, varies in capacity and shape with the contents of the viscera. The difference in the shape of the abdomen in the adult male, the adult female and in infancy is suggestive.

In the adult male, it is barrel-shaped. The infantile type is a truncated cone with the narrow part below as the pelvis is undeveloped. In women the type is the infantile reversed with the broad portion below regardless of so-called civilized dress (Gray).

No organ of the body manifests such changes in position and shape as does the stomach. When empty it has usually the form of a fishhook 10 to 12 inches long, 3 to 4 inches wide and about 3½ inches in its antero-posterior diameter, with a capacity of 5 to 8 pints, and lies in the back part of the left abdomen. The pylorus is directed downward and to the right and the fundus upwards and backwards.

When distended it becomes pyriform in shape and its long axis is directed down, forward and to the right. The greater curvature is elevated and carried forward and the anterior surface presents upwards.

The distended fundus may press on the diaphragm and interfere with breathing and the action of the heart.

During inspiration it is displaced downward by

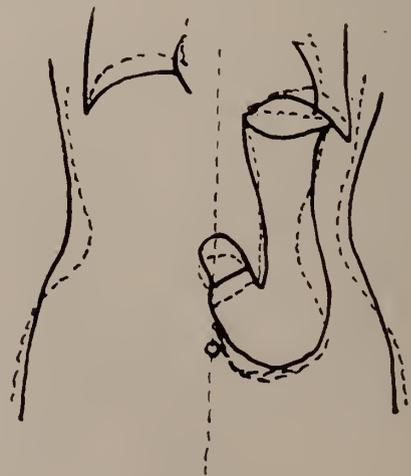


FIG. 1.—Female.
Normal Stomach in Male and Female (Froedel).

* Read before the Third District Branch of the Medical Society of the State of New York, at Kingston, October 3d, 1911.

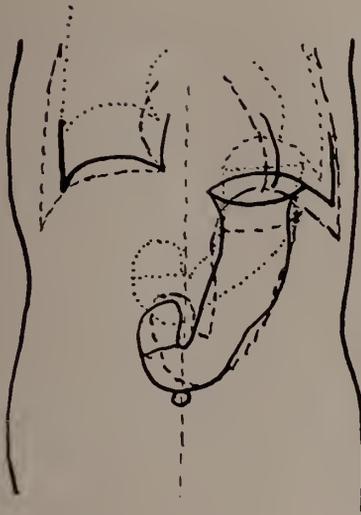


FIG. 1.—Male.

the diaphragm, and elevated during expiration by the abdominal muscles. Pressure from without may push the stomach down towards the pelvis and tight lacing may press it over entirely to the left side and make its position vertical.

The stomach is divided by a special thickening of the circular fibres into two parts, the body including the fundus or reservoir, and the pyloric portion.

Solid food remains for a variable length of time in the stomach while some liquid food is forced at once into the duodenum. The salivary digestion continues until inhibited by the acidity of the gastric secretion. The food is forced into the pyloric portion by gradual muscular contractions which become more forcible as digestion progresses and recur at very short intervals. The pyloric portion lengthens and its contractions press the contents against the sphincter of the pylorus. If the contents consist of hard masses and do not hold much hydrochloric acid, the period of pyloric closure is prolonged and the gastric contents are forced back and forth until they are sufficiently liquid and acid, when the sphincter of the pylorus relaxes and allows some of the fluid contents to pass with considerable force into the duodenum. Relaxation of the pyloric sphincter seems to depend on the consistency of the food and especially on the percentage of hydrochloric acid in the gastric contents. Hydrochloric acid in the stomach favors relaxation of the pylorus while in the duodenum it on the contrary excites a contraction of the sphincter.

The stomach secretes hydrochloric acid, pepsinogen activated into pepsin, which digest the proteids, rennin which acts on milk and lipase which slightly affects the fats.

It mechanically and chemically prepares the food and discharges it in quantities easily handled by the intestinal secretions. Fifty per

cent. of the proteids pass through the pylorus as peptones or proteoses. Twenty per cent. of the proteids pass through the pylorus unchanged. Thirty per cent. of the proteids are absorbed in the stomach.

Pawlow has clearly shown that digestion is not simply a chemical process and the stomach a test tube, but that the psychic or mental element is by far the most important. Pleasurable emotions and sensations increase the gastric secretion while rage, distress, anxiety, and distractions inhibit it.

Cannon found by radiography that all the movements of the stomach in cats ceased as soon as the animal showed signs of anxiety, rage, or distress.

The small intestine—duodenum, jejunum and ileum—is twenty feet in length and gradually diminishes in calibre. It has two movements—peristaltic for pushing forward its contents, and pendular or rhythmic for mixing the contents and aiding absorption.

The peristaltic is a progressive constriction of the intestines passing downwards, while the part behind gradually relaxes and that in front dilates.

The rythmical movements are local contractions occurring rythmically at those points where the masses of food lie, causing repeatedly segmentation and then reassembling of the segments, like the mixing of dough.

The intestinal digestion begins in the duodenum and is largely completed at the ileo-caecal valve. The acid of the gastric secretion incites from the mucous membrane of the duodenum, the production of secretin which is absorbed, carried to the pancreas and stimulates that organ to the secretion of the pancreatic juice. This contains trypsinogen which acts upon proteids; amylopsin which digests starches, and lipase which splits up fats. Trypsinogen is not active until stimulated by a secretion from the mucous membrane of the small intestine called entero-kinase which converts trypsinogen into trypsin.

The action of lipase in splitting up the fats is aided by the secretion of bile either as a co-ferment or a simple stimulant to the lipase.

The bile thus accelerates the action of the lipase and also removes certain waste products of metabolism, as cholesterolin, lecithin and bile pigments, the latter of which may be re-absorbed and again used.

It has been generally accepted that bile is an efficient intestinal antiseptic and therefore prevents excessive putrefaction.

Bile, however, has very feeble antiseptic power. The explanation for the increased putrefaction when no bile passes into the duodenum, is that the proteids and carbohydrates may be covered with fat, which is undigested, and therefore they are not so easily attacked by their ferments trypsin and amylopsin, resulting in greater

opportunity for putrefaction in the proteids and carbohydrates.

There are five enzymes developed from the mucous membrane of the small intestines. Entero-kinase, which activates trypsin; erepsin, which acts on peptones; maltase, invertase and lactase, which change the carbohydrates; nuclease, which digests nucleins and secretin, which stimulates the secretion of the pancreas.

The small intestine absorbs very readily, ninety-seven to ninety-nine per cent. of the more easily digestible animal foods, as milk, eggs, and meat. Those foods which contain much cellulose leave seventeen to thirty per cent. unabsorbed.

The lacteals take up the fats, which pass into the circulation by way of the thoracic duct. The capillaries of the villi absorb the end products of the proteids and carbohydrates and they pass into the general circulation through the liver by the portal circulation. 500 grams of sugar may be digested and absorbed in a day. It reaches the blood as dextrose and is carried to the liver, which withdraws the excess and stores it as glycogen. The percentage of sugar in the blood thus usually remains constant. When an excessive quantity of sugar is taken and absorbed, the liver may not be able to remove all the excess and then hyperglycæmia results and sugar is excreted by the urine—alimentary glycosuria.

The large intestine is five feet long, extending from the ileo-cæcal valve to the sigmoid flexure. It is divided into three parts, the ascending, transverse, and descending colon. The ascending colon is usually attached to the posterior abdominal wall and presents two parts of special importance—the appendix vermiformis and the cæcum. The cæcum is a large blind pouch into which the liquid chyme begins to be discharged as early as two hours after the ingestion of food and where the food remains for some time. The cæcum and ascending colon act as the second reservoir of the gastro-intestinal tract (the stomach being the first reservoir). A large part of the water contained in the chyme is here absorbed. In cases of constipation and autointoxication, the cæcum frequently retains considerable portions of the chyme for several days, and we have observed the center of the intestinal contents at this point move on to the succeeding portions of the colon, leaving particles and even masses of the chyme apparently in a condition of stasis along the walls of the cæcum and in pouches along the intestine. Associated with the fact that antiperistaltic waves exist in the cæcum and appendix, this observation has an important bearing on the reason for the prevalence of appendicitis. The transverse colon is the longest portion of the large intestine and is very mobile. The splenic flexure is usually found higher in the abdomen than the hepatic flexure and it is rare to find a ptosis of this flexure, while that of the hepatic flexure is common. The descending colon extends from the splenic flexure to the

crest of the left ilium ($8\frac{1}{2}$ inches) where its name changes to the sigmoid or S-shaped flexure.

The musculature presents the same outer longitudinal and inner circular fibres as in the small intestine. The movements of the colon are slower than those of the small intestine and are described as consisting of five different forms: 1, a pendular movement; 2, a rhythmic segmentation; 3, peristaltic waves; 4, a rolling movement; 5, antiperistaltic waves. All these movements are more noticeable in the ascending and transverse colon than in the descending colon. The antiperistaltic waves delay the progress of the food, while the other movements advance the food and all help to mix the food with the intestinal secretions, promoting the actions of the enzymes and the absorption from the intestine. There is a slight alkaline secretion in the colon containing some enzymes with considerable mucus. After reaching the colon the intestinal contents show a dark brown discoloration due to the change of bilirubin to hydrobilirubin and begin to assume the fæcal odor which is mainly due to skatol. Putrefaction due to bacilli, becomes apparent. As the bowel contents advance in the colon they become more solid, due to the absorption of water.

Bacteria are present in the small and large intestine, but those which attack the carbohydrates are active. Protein fermentation is slight on account of the rapid absorption of the digested proteids.

The pelvic colon or sigmoid flexure is a movable loop about $17\frac{1}{2}$ inches (44 cm.) long which joins the rectum at an acute angle. This junction is marked by a distinct increase in the circular muscle fibres called O'Bierne's sphincter. The position of this viscus varies widely according to its contents. The rectum (5 to 7 inches, —12 to 15 cm.—long) extends from the retro-sigmoid junction to the ano-rectal line; it rests in the hollow of the sacrum and coccyx, except its lower third which extends backward at a right angle to its upper two-thirds, and pierces the pelvic floor, ending at the ano-rectal line or linea dentata. The anal canal is not sacculated and in it the musculature becomes blended and increased to form the internal sphincter muscle. The mucous membrane lining this canal is thrown into semilunar folds, usually three in number, known as Houston's valves which are supposed to have the function of supporting the fæces. When these valves become hypertrophied they may cause constipation. The linea dentata is composed of anal papillæ appearing in a more or less distinct line of small saw-tooth-like triangular projections which encircle the anal canal. Just behind these papillæ, are found the openings of the crypts of Morgagni. The anal papillæ and crypts of Morgagni are of especial interest because they are often the seat of inflammatory conditions which present symptoms

often out of all proportion to the size of the lesion causing them.

For clinical purposes, chronic diseases of the gastro-intestinal tract may be divided into (a) those showing disturbances of function alone and (b) those showing disturbances of motility and function.

Diseases which exhibit disturbances of function are less serious because one organ usually compensates for the loss of function in another.

The kidneys act more freely than the skin in the winter and vice versa in the summer. In total absence of gastric secretion, as in achylia, the duodenum compensates by increased activity.

Diseases characterized by disturbances in motility are more serious. The organ affected hypertrophies in order to do the increased work and then degenerates.

Valvular lesions of the heart are practically of no importance until the motility of the heart begins to fail. Motor disturbances in diseases of the gastro-intestinal tract are likewise always of serious omen.

Laboratory tests enable us to determine differences in the functions of an organ and also marked disturbances of motility, but the X-ray indicates slight interferences with motility and what is more important, the exact point where the disturbances occur.

The following illustrations indicate the aid rendered the clinician by the X-ray findings.

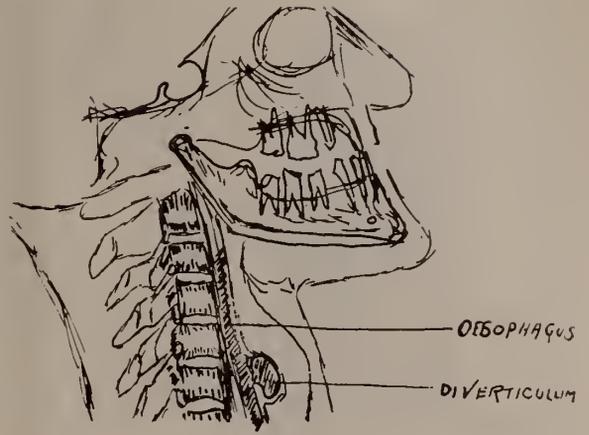


FIG. 3.

of her œsophagus. This lump usually appeared after eating, and gradually disappeared of its own accord within an hour or two after it appeared. Pressure over it with gentle manipulation caused it to disappear. Diagnosis verified by operation. Case reported by kindness of Dr. L. G. Cole.

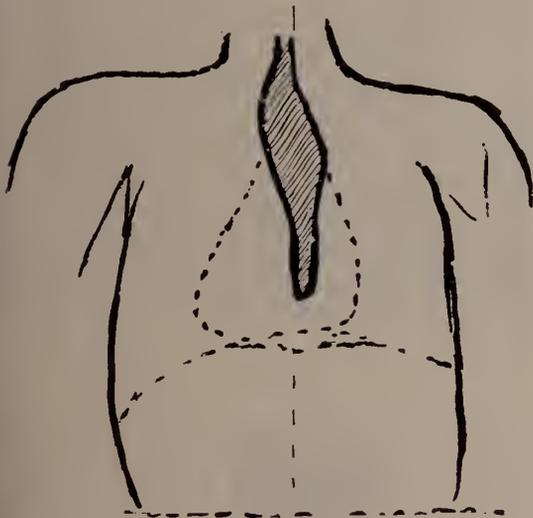


FIG. 2.

CICATRICAL STENOSIS OF THE OESOPHAGUS.

Child three years of age swallowed by mistake for drinking water, a solution of caustic potash. Gradual dilatation with bougies. Recovery.

DIVERTICULUM OF THE OESOPHAGUS.

Young woman aged 18 years, who has noticed for the past five years a gradually increasing lump would present in her throat over the region

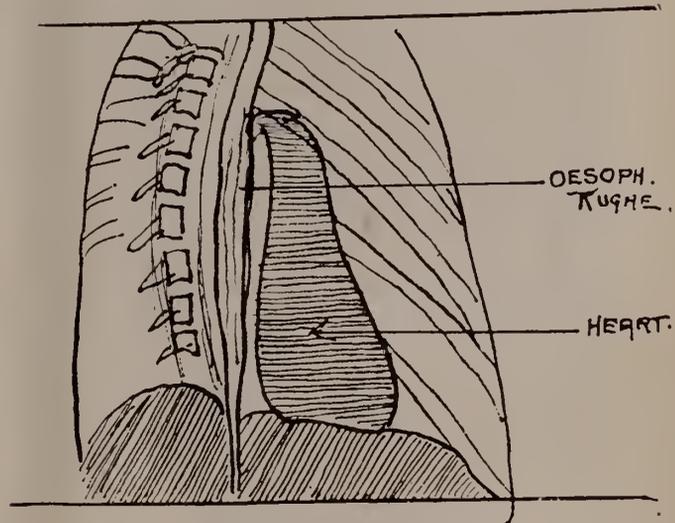


FIG. 4.

OESOPHAGOSPASM.

Male, aged 36 years. History of chronic alcoholism, increasing difficulty of swallowing, food causes distress in passing through the thorax, indicated by the patient as being deep beneath the sternum, all forms of food distresses him and is liable to result in vomiting. Pain also in stomach, of a burning character. Chronic alcoholic œsophagitis and gastritis.

CARDIAL SPASM.

Boy, 18 years of age. Five years ago began to regurgitate about once a week a little solid food. Three years later, regurgitated all solid

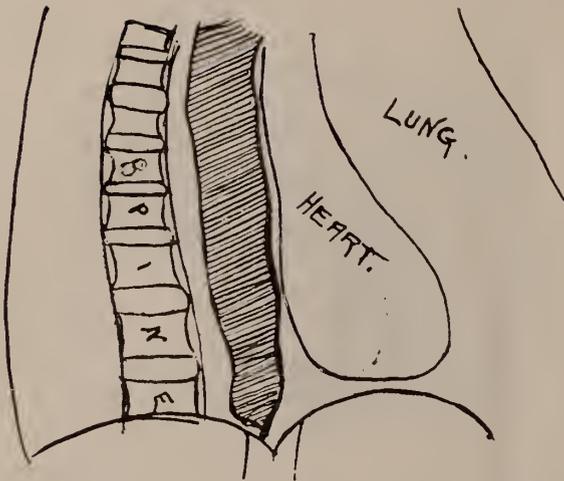


FIG. 5.

food, would rechew it and swallow it. Now regurgitates food at every meal and has a feeling of pressure under the lower portion of the sternum when he swallows. Acid, cold and solid food especially induce this condition. Family history and previous health good. Physical examination negative. Has become exceedingly nervous and embarrassed. When the stomach tube was passed down thirteen inches, some of the test breakfast was obtained unchanged. After the tube was passed into the stomach, the contents then obtained showed a total acidity 110, free hydrochloric acid 66, no lactic acid and complete power of digestion by the Mett and Hammerschlag methods. He was advised to eat slowly with a small spoon and to masticate thoroughly. He has shown continuous improvement and is now practically well.

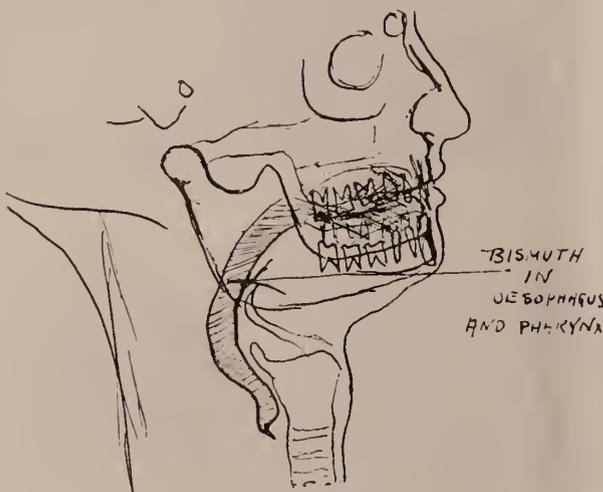


FIG. 6.

CARCINOMA OF THE UPPER ŒSOPHAGUS.

Female, age 40 years, has been complaining for several months of indefinite distress in the

throat which was regarded as of nervous origin. Finally there was such difficulty in swallowing that an unsuccessful attempt was made to pass a stomach tube. Even under complete anæsthesia it was impossible to pass œsophagus bougies. Gastrostomy. Death two months later from extension to the larynx.

CARCINOMA OF THE ŒSOPHAGUS.

Female, aged 68 years, has experienced gradually increasing difficulty in swallowing for the

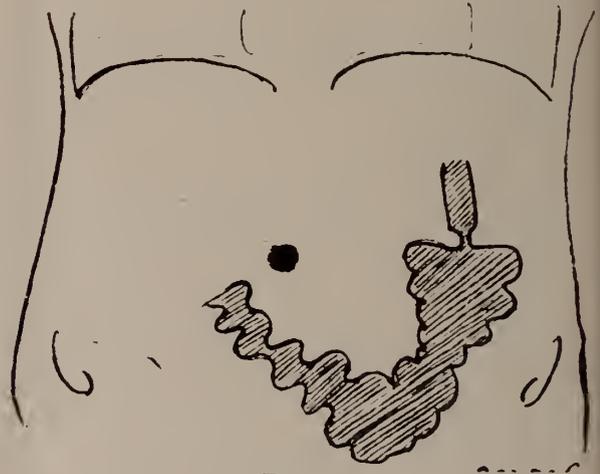


FIG. 7.

past three years. For the past year this has become very much worse, so that she can only swallow liquid food very slowly else it regurgitates. Solid food causes terrific pain deep in the thorax with vomiting of the food with blood. Patient has lost fifty pounds. Bougies cannot be passed into the stomach. Gastrostomy performed with much relief to the patient, consequent gain in weight and strength due to direct feeding through tube inserted into the stomach. Patient died about 9 months after operation. General carcinomatosis.

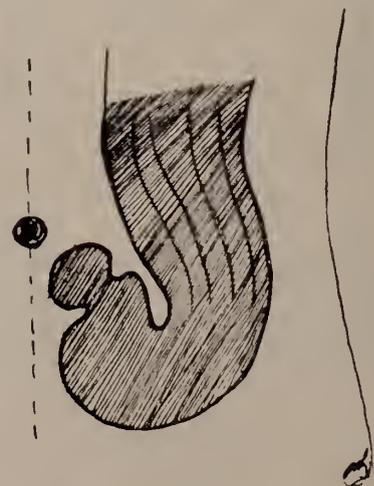


FIG. 8.

PTOSIS AND ATONIC DILATATION OF STOMACH.

Female, aged 37 years, complained of fullness of abdomen, indefinite pains, flatulence, "bilious attacks," constipation. Gastric analysis negative. Occasional attacks of nausea and vomiting with headaches. No blood in vomitus nor stools. Note "fish-hook" stomach wall below umbilicus, peristaltic waves on greater and lesser curvature, those on the greater curvature being long and undulatory. Rugæ outline marked. Fig. 25 shows colon of this same patient.

STENOSIS OF PYLORUS—CARCINOMA—DILATATION.

Female, aged 54, had all the signs and symptoms of a carcinomatous stenosis of the pylorus. The outline of the bismuth meal represents the food still remaining in the stomach 12 hours after ingestion.

ULCER OF THE STOMACH.

Female, aged 37 years. Definite localized pain aggravated by eating, patient anemic, had nausea, vomiting, stomach at times would refuse the blandest food. Hydrochloric acid increased in vomitus. Passage of stomach tube contraindicated. Note the absence of peristaltic waves indicated in diagram.

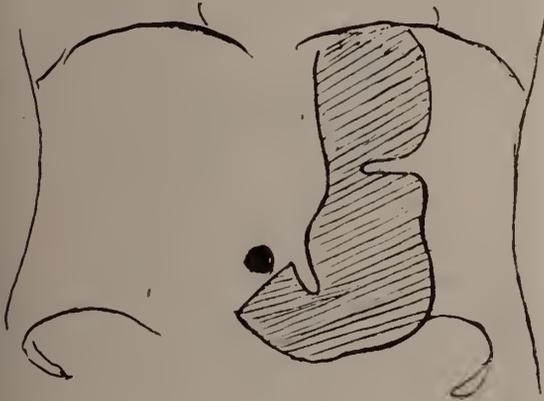


FIG. 11.

HOOR-GLASS CONTRACTION OF THE STOMACH SECONDARY TO ULCER.

Female, aged 48 years, complains of definite localized pain in her left upper abdominal quadrant, which has bothered her more or less for past 20 years. At times it has been very acute, aggravated by food, and she always has been able to indicate by the finger the exact locus of the pain. Seven years ago when this pain was troubling her, she noticed blood in her stools. She is a neurasthenic type of person and numerous physicians have treated her, making a diagnosis of neurasthenia. During the past year, her pain has become general over the abdomen, extends into her back, radiating around the thorax on either side and centres in her breasts.

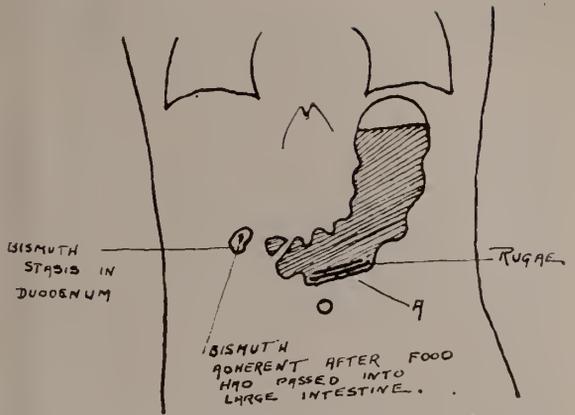


FIG. 12.

GASTRIC ADHESIONS WITH PROBABLE DUODENAL ULCER.

Male, 43 years of age, has had distress in stomach for twenty years, apparently acid. At times severe attacks lasting 12 hours with nausea, vomiting, severe pain and headache; no vomiting of blood. Gastric hyperacidity, areas of sensitiveness in epigastrium and to the right of umbilicus. Note the absence of peristaltic waves at "A" also rugæ visible at this point where they are not normally visible. Note the stasis of bismuth beyond the pylorus in duodenum. This bismuth was visible at this point for a period of more than six hours after the bismuth ingestion; the bismuth during the first hour seemed to be held in some bulk which was interpreted as due to spasmodic "splinting" of the muscles of the duodenum. Later observation showed the persistence of the bismuth in a small constant locus, and a tentative interpretation made of ulceration of sufficient degree to cause adherence of bismuth. We assume that this is such a bismuth shadow as has been described by Ashley as diagnostic of duodenal ulcer, however, this is the only instance of this shadow that we have encountered in our experience and only suggest this as a tentative interpretation.

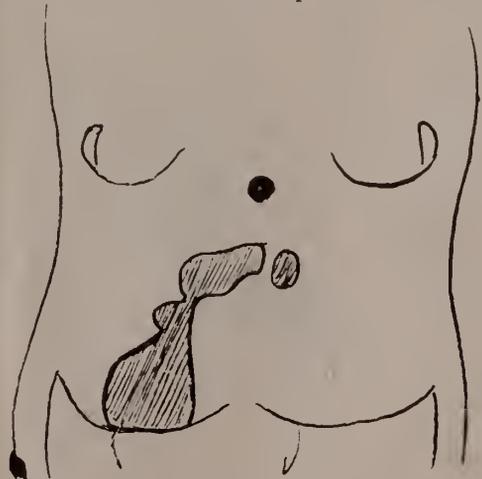


FIG. 13.

HOURLY CONTRACTION OF THE STOMACH— SECONDARY TO MALIGNANCY PROBABLY FOLLOWING AN ULCER.

Male, 63 years of age, has had gastric irritability for many years. In the winter of 1909 and 1910, had severe disturbance with his digestion, pain, vomiting and belching, and his weight went down to less than 120 pounds (his usual weight was about 145 pounds). Slow improvement, but finally became strong enough to take long automobile tours during the summer. His weight went up to 149 pounds and had not been so well in years. Repeated examinations of stomach contents and vomitus practically always showed free hydrochloric acid and usually increased in amount. In the autumn he gradually began to fail and his previous symptoms returned. Exploratory incision showed the stomach small, contracted, and enveloped in a cancerous mass.

CASE OF GASTRIC ADHESIONS PROVED AT OPERATION.

(Cole) Rugæ visible in pyloric portion interpreted as indicating contractures of the external coats of the stomach, thus wrinkling the mucosa.

FOREIGN BODY IN STOMACH.

Hat pin, 6 $\frac{5}{8}$ inches long, swallowed by a 20-months old child—gastrostomy. Recovery.

CARCINOMA OF STOMACH—WITHOUT PALPABLE TUMOR.

Female, aged 48 years. Present illness began three years ago when she began to have "indigestion" which was supposed to have followed prolonged sittings at a dentist's office for bridge work. Sensation of burning and distress after eating, with belching of gas, then loss of appetite and constipation. No nausea, vomiting or pain, and her digestive symptoms almost entirely disappeared. She became markedly cachectic and lost 60 pounds in weight. Urine negative. Blood showed a slight secondary anæmia. No tumor palpable.

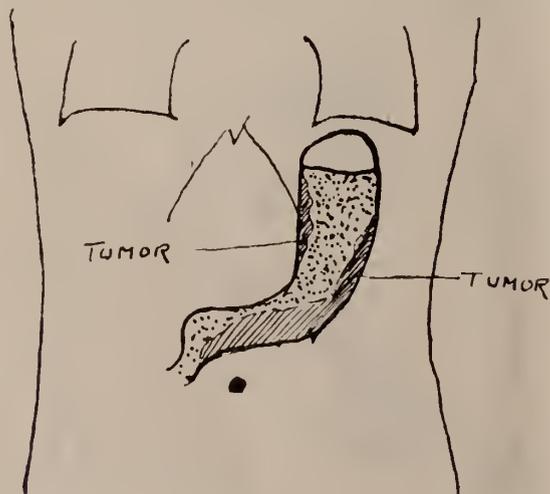


FIG. 24.

DISPLACEMENT OF ASCENDING COLON AND APPENDIX.

Male, 53 years of age, has had trouble with his stomach for ten years. Pain and soreness, more or less, continually in the abdomen. A feeling as if his insides were tied in a knot. Condition supposed to be neurasthenic by many who examined him. Examined by a prominent surgeon who made the diagnosis of cancer of the stomach. Operated upon and the ascending colon and appendix were found on the left side. Appendix removed and the colon anchored to the right side. For six months after the operation he felt much better, but old symptoms returned and his present condition is the same as before the operation.

(Operated upon successfully since reading of paper by lateral intestinal anastomosis.)

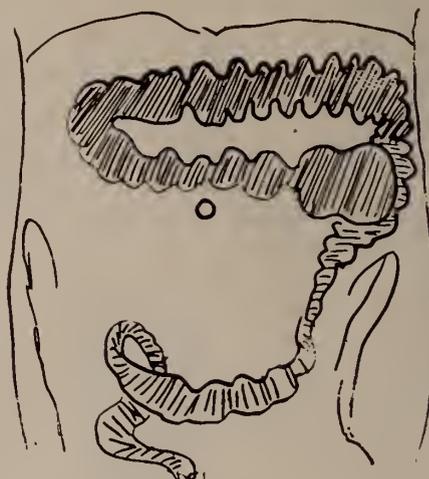


FIG. 25.

PTOSES OF THE TRANSVERSE COLON.

Female, aged 40 years, has suffered from bilious attacks for the last three years. These attacks occur about every three weeks, consist of nausea and vomiting of a clear, greenish-yellow bile without food and incapacitate her for several days. She has always been constipated. Abdomen markedly relaxed and splashing easily obtained some hours after ingestion of food. Right kidney enlarged and readily palpable. Has lost 15 pounds in the last year. Sprüdel salts, elixir of iron, quinine and strychnine, oil enemata, abdominal exercises, diet and pelvic belt removed these attacks. During the summer subjected to repeated nervous strains, and neglected herself. She developed a severe tachycardia lasting ten days which was finally controlled by repeated doses of castor oil and high enemata.

CARCINOMA OF LARGE INTESTINE.

Female, aged 43 years, giving an indefinite history of abdominal pain, constipation, flatulence, headaches, nausea, vomiting paroxysmal. The

INTRATRACHEAL INSUFFLATION ANESTHESIA.*

By WILLIAM C. WOOLSEY, M.D.,
BROOKLYN, N. Y.

WE have before us for consideration and discussion a considerable departure from the usual procedures in general anesthesia, namely the Meltzer-Auer intratracheal insufflation of anesthetic vapors. As is very proper and natural when things new appear, there are many questions to think about and weigh the value of, pro and con, for example, safety, morbidity, practicability and efficiency.

The surgical atmosphere of 1846 was so overwhelmed with the beneficence of Morton's crystal sphere and its magic pain eliminating power that little else was demanded of anesthesia than analgesia, so that occasional deaths or serious sequelæ were looked upon as trivial compared with the general boon conferred. Today even the infrequent death from anesthetic administration is considered an anesthetist's crime and any considerable postoperative sequelæ as reflecting upon his efficiency.

Tracheal insufflation narcosis in addition to meeting the special requirements of thoracic surgery must measure up to a high ideal of anesthetic efficiency before it can to any extent enter into the general field of narcosis.

Beside the laboratories of the Rockefeller Institute, where tracheal insufflation anesthesia had its birth, the physiological laboratories of the whole country have adopted it as a routine procedure in animals and seem convinced that it not only presents no contraindicatory factors but that its virtues overcome many previously encountered difficulties.

The annals of surgery is replete with favorable reports from the pen of Dr. Elsberg¹, whose experience with tracheal insufflation, on the human at Mt. Sinai Hospital now numbers five hundred or more cases; here and there throughout New York and Boston smaller series of cases all add to the general acclamation of its value.

At the third international congress of surgery held at Brussels, September, 1911, Prof. Garré Bonn expressed dissatisfaction with both negative and positive differential pressure cabinets as used in lung surgery and recommends tracheal insufflation. MacEwen of Glasgow said that he had discarded hypo and hyperpressure apparatus in dealing with abscess of the lung. The general conclusion of the whole congress was extremely unsatisfactory on account of the inefficiency of existing methods that prevent acute pneumothorax and permit lung surgery.

We believe that in tracheal insufflation Meltzer and Auer have pointed out the way to great progress in intrathoracic surgery. If the physi-

* Read before the New York Society of Anesthetists, March 6, 1912.

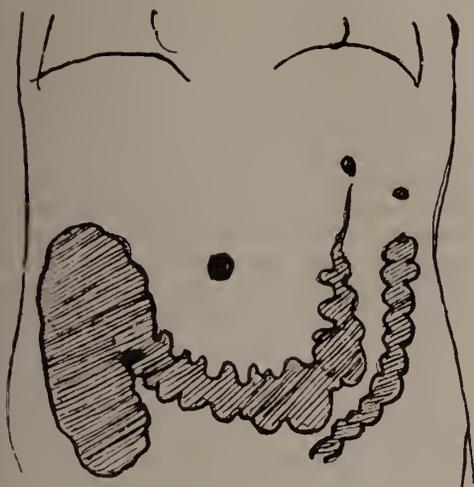


FIG. 26.

X-ray examination showed definite obstruction at a constant point with evident encroachment on the lumen of the gut shown by absence of continuity of the bismuth shadow. Confirmed by operation.

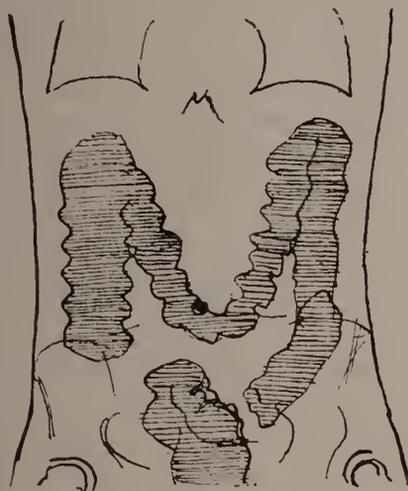


FIG. 27.

CARCINOMA OF LARGE INTESTINE.

Stenosis shown in large intestine near splenic flexure—bismuth ingested by mouth. Radiograph made 24 hours after ingestion.

MEGALOCOLON—CONGENITAL DILATED COLON—HIRSCHSPRUNG'S DISEASE.

Boy, seven years of age, has had digestive disturbances since birth. Gradually increasing constipation with enlargement of abdomen which first became noticeable at his tenth month. Now he is markedly emaciated. Pronounced prominence of the abdomen with visible vermicular movements, movement of the bowels at long intervals. (Patient of Dr. H. J. Lipes.)

ological problem of maintaining proper respiratory exchange and analgesia coincidentally can be furnished by anesthetists, the surgeon will find his way soon enough.

At the present writing there are two fields in which tracheal insufflation can be used; these two fields are only indefinitely separated, the one where acute pneumothorax demands the perfection of the principle of intrapulmonary pressure, the other where tracheal insufflation of anesthetic vapor is the important factor and more than minimum pressure is a secondary consideration. The first field in other words, being that of intrathoracic surgery and the second that of anesthesia in general.

At the present stage of development of insufflation anesthesia, the urgent and special demands of intrathoracic surgery permit the surgeon to accept the possible hazards of the technic, but naturally delay their approval of its adoption for general use, until we as anesthetists have acquired the skill and perfected the technic necessary. It becomes our duty to orientate or determine our position.

The physiological principles relative to insufflation anesthesia are not so many, yet intensely important: Physiologists themselves are by no means of one mind as to the physics of the respiratory act in its entirety. The important facts from our point of view are:

1. The possibility of danger to the tracheal or pulmonic tissues by the introduction of an intratracheal tube.

2. The effect of the direct application to the tracheal and pulmonic mucous membranes of ether vapor.

3. The effect of fifteen to twenty millimeters of mercury, intrapulmonary pressure.

4. The effect of substituting tracheal for the normal external respiration in the presence of narcosis and an opened thoracic cavity.

5. The mechanical principles and method of application of the same, necessary for the carrying out of tracheal insufflation anesthesia.

The tracheal mucous membrane is certainly adapted through use and evolution to varied conditions of temperature and dust or infection. Years of coal dust inhalation seem to produce only the innocuous miners' anthracosis. The general use of O'Dwyer's tubes in diphtheria, under most trying infectious surroundings has not led to any common belief that they cause lung complications. Modern bronchoscopy has not been fruitful of local damage from its most vicious looking instrumentation of the trachea. Consider the painstaking experiments of Meltzer, Auer and Githens at the Rockefeller Institute—*J. A. M. A.*, Vol. LVII, No. 7, August, 1911, showing two series of experiments on dogs, in the one charcoal being placed in the pharynx and in the other forced emesis of infected stomach contents, with the result that not in one case where tracheal insufflation was used could there be de-

tected a bit of charcoal or stomach contents in the trachea or bronchi. Lamar, in assistance upon Meltzer, *J. A. M. A.*, Vol. LVII, No. 7, August, 1911, produced purposely in dogs pneumonia and then used tracheal insufflation an hour each day thereafter for ten days, without the death of a single animal. Dr. Elsberg in all of his reports, *Annals of Surgery*, suggests no difficulty of any sort, attributable to the presence of the tracheal tube. Equally favorable in this particular has been the experience of every report on the subject. The conclusion seems justifiable that the introduction of a tracheal tube does little if any harm to the larynx and trachea. The next physiological consideration is the effect of direct introduction of ether vapor to the tracheal and pulmonic mucous membrane. Ether vapor thus used must be of lower concentration than when given through the mouth and nose. Dreser, Offergeldt, Poppert, and Hölscher, have studied very carefully the effect of ether vapor on the respiratory passages. Dreser regards any vapor which cannot be inhaled by the patient while in a conscious state, without coughing, as harmful to the lungs. Applying this test he fixed at 6 or 7 per cent. as the highest concentration which should be used. Hölscher studied the distribution of secretion in the air passages during narcosis and found that there is only a very slight secretion from the air passages below the level of the larynx. By putting coloring matter into the mouth of anesthetized animals he proved that mucous and saliva may be aspirated into the deepest respiratory air passages. His conclusion is that "affections of the lung after ether are for the most part due to aspiration of infectious mouth and throat contents and not due to the irritant effect of ether vapor."

Meltzer, *J. A. M. A.*, Vol. LVII, No. 7, Aug. 12, 1911, proves the effectiveness of the recurrent air stream in tracheal insufflation, in preventing aspiration of throat contents. By using Kuhn's method of peroral intubation without air, aspiration of throat contents was usually fatal.

The conclusion from these observations is that ether vapor must be of lower concentration than that ordinarily used and not at any time higher than ten per cent. and from the experience of the writer such maximum percentage must be at all times gradually attained, never suddenly for the purpose of quickly overcoming too superficial anesthesia.

It has been objected that insufflation with intrapulmonary pressure might cause capillary hemorrhage in the lung, interstitial emphysema, reflex stimulation of the vagus, hypertension in the pulmonary veins with back pressure in the right heart. Quimby of Boston, *Surg. Gyn. and Obstet.*, Vol. XI, No. 5, 482, has subjected to microscopical examination lungs which have been inflated to the point of filling the opposite pleural space after a unilateral pneumectomy and he says that none of the specimens so examined

gave the slightest evidence of changes of the nature referred to above.

The low pressure necessary in insufflation of nonthoracic cases is certainly without harm and evidence that the twenty millimeters used in intrathoracic surgery does do harm has been markedly lacking in the many cases now reported if it truly exists.

On the question of substituting tracheal for ordinary external respiration, rests some of the physiological doubt and mechanical difficulty of the insufflation procedure. If there be one element in general anesthesia, next to that of actual overdosage of the anesthetic, that causes more trouble than any other to the expert and tyro, to patient and surgeon, it is some disturbance in that part of the breathing airway between the teeth and the trachea, some obstruction or interference with proper respiratory exchange and therefore with proper dosage of anesthetic. Collapsed thin ala nasi, valvelike lips, recedent tongue and jaw, paralyzed soft palate and glottis, with or without a hypersecretion of mucous all tend to obstruct the airways and produce asphyxia, alternating toxic dosage of anesthetic with aggravation of the above conditions and too superficial narcosis with muscular rigidity and labored breathing.

This obstructive respiratory syndrome is fought with throughout a narcosis until the circulatory apparatus can no longer stand the strain and goes into a state of collapse. The improvement of modern anesthetic technic has overcome these conditions to a considerable degree, yet in the plethoric, athletic, alcoholic, short necked adipose subject, such a condition of resistance to ether especially, still exists.

The tracheal exhibition of anesthetic vapors as instituted in insufflation narcosis carries the anesthetic well past these obstructive possibilities of the external respiratory apparatus and in addition to providing a continuous supply of oxygen carrying air, with the anesthetic vapor, it institutes a continuous outflow as well. The writer's work among the dregs of humanity such as are daily anesthetized at our municipal hospitals has offered the opportunity many times for him to have the satisfaction of seeing one of these subjects brought to the operating room after fifteen minutes or more of struggle on the part of the interne at initiating anesthesia and after the introduction of the tracheal tube with a few seconds of pure oxygen insufflation, see the deadly cyanosis give way to beautiful pink, the labored breathing to quiet respiratory exchange and the intermittent pulse to a steady soft one. The anoxemia has been eliminated, the external respiratory obstruction done away with, the ether cut to one-quarter its previous dosage, and administered in continuous minimum quantity of low concentration, and the operative mortality certainly halved.

The surgeons at Kings County Hospital, seeing this change, have started to practice the introduction of the tube themselves, merely for its resuscitative usefulness, in cases where respiratory obstruction becomes dangerous during ordinary narcosis. As a side issue at this point may be mentioned the extreme usefulness of quickly raising the epiglottis with the finger in cases of respiratory spasm so-called that may occur in any ether narcosis. The paralyzed epiglottis is sucked tightly against the vocal cords by the powerful muscular effort to get air and when it is raised by the finger it comes away like the cork out of a bottle. Rhythmic traction of the tongue, holding forward the jaw, manipulating the chest is all play when this valvelike closure of the glottis is present.

Thus a field distinctly outside that of thoracic surgery opens before us in tracheal insufflation anesthesia, for such cases as cited do occur outside municipal hospitals and they can usually be recognized beforehand and prevented.

The question of tracheal insufflation versus differential pressure cabinets in intrathoracic surgery is best expressed perhaps in the words of Quimby of Boston, *Surg., Gyn. and Obstet.*, Vol. XI, 5, 482, who says: "In all positive and negative pressure contrivances expiration takes place at a disadvantage; the patient must expire against an abnormally high pressure. Both forms of differential pressure have been shown to be identical in their physiological action. Dryer & Spannaus, *Beit. z. Klin. Chirurg.* bd. lx. s. 110. The barometric pressure in each, which obtains on the surface of the lungs is less than that within their air spaces. Whether expiration be performed by the diaphragm and chest wall, or by the elasticity of the pulmonary tissue alone, it must of necessity work against this difference in pressures. This means that an increased amount of work is thrown upon the right heart which must compensate. Also hypercapnia is a constant condition of this limited respiratory exchange. Janeway & Greene, recognizing these difficulties, have provided true artificial respiration independent of the patient in the cabinet of their suggesting. The principle of tracheal respiration as carried out in intratracheal insufflation anesthesia eliminates all external respiratory difficulties, narcosis is provided for and intrapulmonary pressure is maintained not at the expense of the respiratory factor of safety but adding to it. Breathing is carried on not at the expense of great effort on the part of the respiratory mechanism in overcoming external pressure, but independent of such effort.

Considered from the point of view of our distinguished member, Prof. Yandel Henderson of Yale, no considerable degree of acapnia can be produced by any ordinary artificial ventilation of the lungs. Through a tracheal tube, he says, Henderson, *A. J. of Phys.*, Vol. XXV, No. 6,

"Our first experiments in which we administered artificial hyperpnœa by means of a hand pump failed, that is failed to produce acapnia. The operator of the bellows was tired in ten minutes, showing the vigor of his efforts perhaps, while the animals if the ventilation was then stopped, exhibited only a brief period of apnœa and an inconsiderable fall of blood pressure. Later we adopted a form of apparatus that both introduced air into the lungs and sucked it out again at the rate of one hundred and twenty respirations per minute, this exaggerated respira-

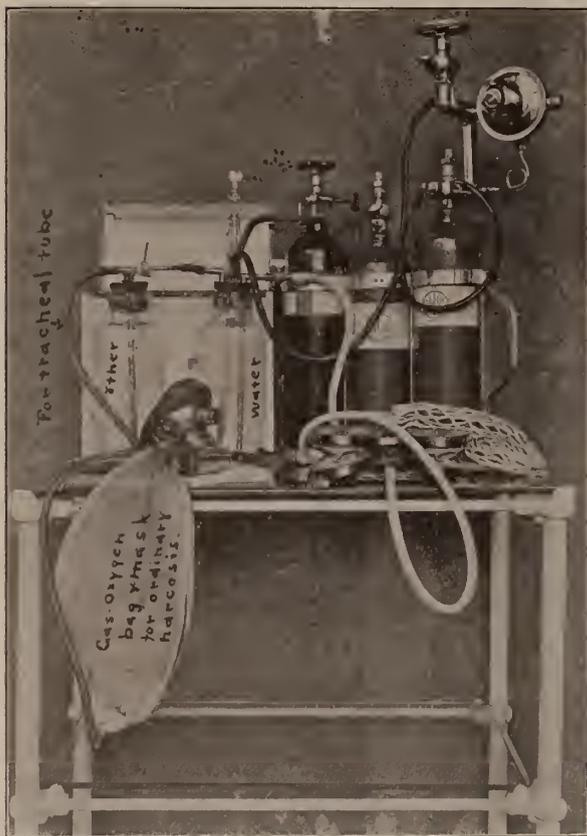
tion, when oxygen is supplied in abundance, as expressed by the English physiologists Holdane and Poulton, the role of hypercapnia in such pulmonary ventilation as is adopted in tracheal insufflation narcosis, must be small indeed. As expressed by Meltzer, "With only that part of the dead space in the respiratory airway between the teeth and the lower extremity of the trachea obliterated by the tube, there still remains that in the bronchi and pulmonary acini and if actual apnœa occurred, the stream of air through a tracheal tube would not completely remove the air from this untouched air space, therefore a serious degree of hypercapnia would occur at that point and danger from carbon dioxide poisoning would result. But with tracheal insufflation narcosis, respiratory efforts are distinctly and regularly maintained so that danger from that source is eliminated. If, however, such voluntary breathing does not continue on the part of the patient, as may well happen if toxic dosage of ether be used, then periodic deflation of the lungs becomes a necessary element in the maintenance of the insufflation form of respiration. Meltzer advises such periodic deflation in all tracheal narcoses in order to be on the side of safety.

We have then in tracheal insufflation anesthesia, tracheal respiration with elimination of any possible anoxemia from external respiratory obstruction, with absence of all embarrassment of respiration as from differential pressure cabinets, we furnish constant minimum dosage of anesthetic vapors at lowest concentration, induce no serious degree of acapnia, provide against hypercapnia and for complete oxygenation; we render intrathoracic surgery possible through prevention of acute pneumothorax.

Thus far in our consideration we have looked at our subject from an optimistic and supportive point of view; there have been reported however, and there certainly exist, damaging factors in tracheal insufflation if the technic is in any way faulty. No complicated surgical problem exists but what experience has shown where early efforts were at fault and only in observing those faults has progress been attained.

Five patients have died to the knowledge of the writer, after tracheal insufflation anesthesia and more or less serious operative procedure. The part played by the narcosis as compared with any form of anesthesia may be judged from the details of these cases.

CASE I.—At Kings County Hospital, Brooklyn. Operation for exsection of the carotid on the side of an inoperable malignancy of the mouth and jaw. After a very difficult induction of the anesthesia by hospital interne during which he had to resuscitate the subject several times, the tracheal tube relieved all the embarrassment of respiration and circulation. Anesthesia was car-



tory pace being continued for ten to twelve minutes.

Prof. Henderson's experiments were conducted to demonstrate the harmful effects of over-ventilation of the lungs in producing a state of carbon dioxide deprivation or acapnia, but coincidentally have not his experiments demonstrated that tracheal respiration as carried on through a tracheal tube and by means of an air pump must be exaggerated to the point of marked artificial hyperpnœa before danger from over-ventilation of the lungs can be caused from the acapnic point of view?

Considering the innocuousness of any reasonable degree of hypercapnia or carbon dioxide re-

ried on for fifty minutes with absolute satisfaction to surgeon and anesthetist, but after withdrawal of the tracheal tube the patient's voluntary efforts at respiration would not resume a sufficient degree of regularity and efficiency to prevent anoxemia, of which condition he died.

Autopsy showed eight-tenths of his lung tissue involved by a general miliary tuberculosis and the complete æration of the blood during narcosis must have been carried on with a markedly limited absorbing surface. The death can hardly be attributed to tracheal insufflation for no anesthesia could afford to trample on so narrow a margin of safety as this subject possessed.

CASE 2.—Fisher, *Surg., Gyn. and Obstet.*, Vol. VIII, No. 5. Carcinoma of the œsophagus, adherent to root of lung, glands along aorta. Toward the end of the operation, after air had been given for some moments, it became necessary to give more ether, the wrong clamp was removed from the ether carrying tube, a sudden rise of pressure occurred in the ether bottle through which a small quantity of liquid ether was forced into the air carrying tube and into the lungs. Death from broncho-pneumonia occurred twenty-four hours after operation.

CASE 3.—Uneventful anesthesia but postoperative pneumonia on the fourth day. The same apparatus as used above may have been an element of fatality here.

CASE 4.—Personal communication by Dr. Jane-way, who reports that this death was due to an erroneous introduction of the tube into the left bronchus, and because of the temporary discarding of the safety valve and manometer. The nurse who was actually conducting the narcosis had pushed the tracheal tube too far down the trachea, had attempted to conduct the anesthesia without a manometer because of accident to it on a previous case and the lung was distended to the point of rupture.

A similar accident happened to Dr. Boothby of Boston where no safety valve was used, so that spasm of the glottis shut off the return flow of vapor without means of noticing the same and pulmonary rupture was the result.

CASE 5.—Personal communication by Dr. Meltzer. The opinion of Dr. Meltzer was that the death which was characterized by rapidly increasing cyanosis and emphysema of the tissues in the anterior part of the neck, was due to abrasion of the tissues in the neighborhood of the glottis with resultant interstitial emphysema of an obstructive nature.

In every case but one, No. 3, the cause of death has been easily seen and errors of technic found at fault, not the principles of tracheal insufflation. These errors will be referred to in considering the technic.

Technic.—Tube introduction. Many of the points of difference of opinion relative to the manner of introducing the tube are matters of

individual skill and preference. In the dog the glottis is within easy reach if not sight, when the tongue is drawn forward, but in man the distance is just beyond the reach of an ordinary index finger. Two methods of introduction of the tube have been in use; that of direct inspection through a Chevalier-Jackson laryngoscope and by means of a specially constructed introducer in which the tube is threaded through a tunneled urethral sound with an O'Dwyer curve to hook over the arch of the tongue. The tubation of the trachea being done in a manner similar to intubation for diphtheria. The former method is that used by Dr. Elsberg and the latter by Drs. Cotton and Boothby of Boston, *Surg., Gyn. and Obstet.*, Vol. XIII, No. 5.

Dr. Elsberg of Mt. Sinai Hospital, and Dr. Peck of Roosevelt Hospital, claim no difficulty in teaching internes under them to introduce the tube by direct inspection. The writer's preference has been for the Cotton-Quimby introducer on account of the ease of its use and the absence of any interference when a patient is not deeply anesthetized. With the laryngoscope, pharyngeal spasm causes considerable trouble so that deep narcosis is necessary. The entrance of the tube into the œsophagus can be avoided if just as the beak of the tube is supposedly between the vocal cords, the typical laryngeal hiss of air is listened for and heard, before further introduction is performed; when so heard, an assistant feeds the tube into the trachea to the twenty-six centimeters mark made on the tube. This mark is essential to prevent accidents such as cited in fatal case No. 4 and can be made by a narrow strip of adhesive plaster encircling the catheter.

The tube is a matter of importance. It should be a sterilized, silk woven urethral catheter for direct inspection introduction and soft rubber for the Cotton-Boothby introducer. The size should be 22 French for most adults, occasionally 24 in thoracic cases to insure a return flow of air not too great for the maintenance of sufficient intrapulmonary pressure. The danger from too large a tube is so apparent that to err on the side of safety by using a 22 is much to be commended. In case the catheter is found to be too small through inability to keep the lung inflated when the chest is open, according to the suggestion of Meltzer, pressure just below the thyroid notch every few minutes will remedy the defect. The point for pressure is not above the thyroid notch nor below on the trachea, but at the middle of the thyroid cartilage.

In thoracic surgery the tube must fit with reasonably accuracy the trachea into which it is introduced, but in ordinary nonthoracic work size 22 meets practically all requirements. In introducing the tube with a Cotton-Boothby introducer, the only difficulty experienced, is that the end

of the tube may enter one of the lateral pockets of the glosso-epiglottic folds and thus turn out of direction or because of the instrument being elevated too much, the tube bends against the base of the epiglottis, and fails to enter the laryngeal opening. In case of such failure withdrawal of the tube and reintroduction is necessary. Practice soon obviates such difficulties so that introduction is accomplished at once, and without obstruction.

Apparatus.—The mechanical means used at present to carry out tracheal insufflation anesthesia are of many patterns and of widely different construction. The most complete are Elsberg's, Janeway's and Boothby's, all being costly and rather cumbersome.

The principal features of any practical insufflation apparatus is the air supply, either a foot pump or electric motor or both, a water-containing reservoir through which the air passes, an ether-containing reservoir over or through which the air passes to obtain its varying percentages of ether, a safety valve and manometer which registers the internal pressure of the apparatus and of the lung and allows exit to any increase of pressure above a definite point. Air filters, air warmers, etc., add to the luxuries of perfection and seem advisable. The original apparatus as used by Dr. Meltzer was simple indeed, compared to modern developments, and though such simplicity has its faults, compactness of apparatus and limited cost are desirable.

INDICATIONS FOR USE OF TRACHEAL INSUFFLATION.

1. Intrathoracic surgical cases where its positive intrapul. minary pressure prevents acute pneumo-thorax.

2. Especially useful in that class of case where the obstruction to breathing exists in the airways between the teeth and trachea from collapsed alar nasi, recedent jaw and tongue, paralyzed soft palate and glottis, and in whom narcosis is ordinarily maintained despite serious anoxemia.

3. In those subjects whose factor of safety is lowered by age, disease, etc., the grave risks of surgery, in whom the minimum dosage and perfectly laborless respiratory exchange of tracheal insufflation draws less than other procedures on the narrow margin of safety that such cases possess. Dr. Peck of Roosevelt Hospital has found it especially valuable in prostatic cases.

4. In all operations about the oral or nasal cavities of serious nature where aspiration of blood and tumor material would be a dangerous factor.

The personal experience of the writer has been more along the line of utilizing nitrous oxide and oxygen through the tracheal tube. These two gases are becoming more and more efficient as general anesthetic agents as the elements of light positive pressure and reduced continuous flow of gases is introduced into the technic of their exhibition.

It is a matter of common knowledge among anesthetists that one of the reasons for the inefficiency of nitrous up to the time that Dr. Gatch presented his scheme for use, was the inability to get enough nitrous in solution in the blood to produce narcosis without coincidentally excluding the necessary amount of oxygen which prevents cyanosis. Dr. Gatch excluded air entirely and used only nitrous and oxygen, with the result that a more satisfactory nitrous narcosis was established than ever before. Other technic soon appeared adding to the principle of exclusion of air a certain elevation of pressure under which the gases are breathed. Such elevation of pressure has been carried by some anesthetists to the danger point. At the last meeting of this society, Prof. Henderson warned us of thus raising the pressure of gases breathed, inasmuch as there existed a certain possibility of the gas being forced into the blood stream as a gas and in addition to that, we all recognize the inadvisability of placing such a burden upon the respiratory mechanics as to thus demand expiration against resistance for any great length of time. This is the very objection to most differential pressure cabinets used in intrathoracic surgery. Low pressure of eight or ten millimeters, however, could have neither of these objections and is sufficient to accomplish the desired result. Pressure applied through the intratracheal tube is an entirely different physical proposition, here, up to twenty millimeters might be used if necessary yet not in the least be an obstructive element to respiration.

In *Surg., Gyn. and Obstet.*, Vol. XIII, No. 5, p. 572, July 18, 1911, Boothby and Cotton of Boston reported the first and only case of narcosis by the use of nitrous and oxygen intratracheally:

At first nitrous oxide was given with the usual oxygen coefficient till consciousness was lost and anesthesia was then deepened by the addition of ether till the laryngeal reflex was abolished and then the intratracheal tube was introduced.

No air was used, only nitrous-oxide-oxygen-ether, and presently the ether was cut out, and the greater part of the operation was performed under nitrous oxide and oxygen alone.

At no time was there the slightest trouble. The anesthesia seemed to differ in no way from the usual air-ether cases. A relative apnoea was quickly established and continued (more or less complete) throughout. The color was good, the skin dry and warm, and the pulse (despite a moderate loss of blood during the rectal excision) continued excellent.

This suggested to the writer the possibility of nitrous oxide and oxygen by the tracheal route and his efforts since that time have been along this particular line. Nineteen cases have been thus anesthetized, with ether initiation, and varying quantities of ether in the first six or seven, then as confidence in the nitrous established it-

self, less and less ether until, after the initiation of the narcosis with ether and a small amount to deepen the anesthesia at the very outset of the narcosis, the rest of the operation has been carried on under nitrous oxide and oxygen alone. Three cases of brain tumor were thus anesthetized on the service of Dr. A. T. Bristow at Kings County Hospital and St. John's Hospital, Brooklyn, with equally satisfactory narcosis. It was of interest to note that in none of these cases would the operator admit the presence of any increased cranial tension from the anesthetic, as is usually the case in nitrous anesthesia. (Davis, Johns Hopkins, Baltimore.) Theoretically, the absence of obstruction to the muscular mechanism of external respiration, an active factor in any ordinary nitrous narcosis, where breathing into a bag against even light positive pressure is adopted, is a factor of favorable importance and linked with such absence of obstruction is the fifteen millimeters of intrapulmonary pressure, which insures a sufficient absorption of nitrous for anesthesia. The question of carbon dioxide elimination is provided for first by the diffusion of gases from the end of the tracheal tube through the pulmonary vesicles, second, by the regular, if reduced, voluntary respiratory efforts of the patient; third, by an intermittence of the gas flow from time to time in order that the elasticity of the lung tissue may expel its contents.

The direct exhibition of the gases to the pulmonary bronchi must to a considerable extent lessen if not exclude entirely, any air, so that in the lungs the satisfactory conditions required by the Gatch principle of exclusion of air, must maintain thus fulfilling the principles for successful nitrous narcosis.

No intrathoracic surgery has been attempted under this form of narcosis. The details of the cases are reserved for further confirmation and report at the June meeting of the American Medical Association under the auspices of the New York Society of Anesthetists.

The apparatus used has been a crude and simple two-bottle affair, one bottle containing water, a mercury manometer and safety valve in its rubber cork, and three afferent tubes, one for the conveyance of air from the foot pump through the water, the second for nitrous oxide, the third for oxygen. One efferent tube conveys the gas after it has bubbled through the water over to the second bottle, that for ether. A valve on the top of the ether bottle provides for the stream of air or nitrous and oxygen as the case may be, going either all through the ether or all direct across, or any proportion either way. This allows the air to pick up as much or little ether as desired or none, and likewise, the mixture of nitrous oxide and oxygen, to take up the amount of ether necessary. When air is not in use a stop cock on the air afferent tube must be turned off in order to prevent the extremely disconcerting accident of all the water from the bottle back-

ing up into the pump. When coughing takes place, as it may, just after the introduction of the tube into the trachea, the pressure of gases behind the water bottle must be continuous, that is, the anesthetist must continue the working of the bellows, for the back pressure from the patient speedily forces the water into the bellows. Electrical motor pumps obviate such an accident by their continuous flow of air independent of the anesthetist's action.

CONCLUSIONS.

1. Tracheal insufflation anesthesia offers the best available conditions for progress in surgery of the thoracic cavity.

2. Nitrous oxide and oxygen can be successfully exhibited through the intratracheal tube. Its already acquired reputation for safety plus the apparent ideal mechanical conditions for its use herein suggested opens a field for still further reducing the toxæmia of the anesthetic state.

3. Unfavorable results that have been reported have had their origin in easily remedied faults of technic. Use no force in the introduction of the tracheal tube.

Mark the tube at a point twenty-six centimeters from its end and introduce the tube so that this mark is opposite the teeth. Use only the lowest concentration of ether compatible with narcosis. Never insufflate without an efficient and suitable mercury manometer and safety valve that will register a maximum of twenty millimeters of mercury. Never intrust so complicated a procedure to a nurse.

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THE ADMINISTRATION OF NITROUS OXIDE AND OXYGEN AS AN ANAESTHETIC.*

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A GREAT deal has been written concerning the question of anæsthesia. This is particularly true of the last five years. The index *Medicus* records an average of about

* Read before the Medical Society of the County of Westchester, at White Plains, January 16, 1912.

35 articles a month in the French and English languages alone.

These original articles illuminate anæsthesia from almost every conceivable standpoint, yet this important branch of surgery is but in its infancy.

Future development does not promise a more satisfactory form of oblivion to pain or a more complete muscular flaccidity, but rather a preservation of the natural immunity. Histological and physiological research has demonstrated the presence of degenerative post-operative effects following the use of chloroform which have been irreparable, and which justify extreme caution in the use of this time honored anæsthetic.¹ Both ether and chloroform have been shown to effect the natural immunity by direct depression of leucocytic action.

The untoward effects upon the lungs and the kidneys by the use of these agents is of older recognition.

Here, too, enters a question of the greatest importance, the individuality of the administrator. The action of various agents capable of producing anæsthesia may be profoundly modified by an improper administration. Not only this, but unless the administrator is capable of anticipating the various afferent stimulæ arising from certain manipulations he will either carry on a continuous deep anæsthesia, which is detrimental to the patient, or he will be embarrassed by having his patient come out. In no case perhaps is ready adaptability more necessary than in the administration of nitrous oxide and oxygen.

Our acceptance of a new anæsthetic should be based upon at least two cardinal principles—safety and practicability.

Safety being paramount may well be considered the criterion for our acceptance of a new anæsthetic.

Nitrous oxide oxygen anæsthesia is recognized as the safest general anæsthetic at the present time.

Quoting Gardner, "No fatality or serious complication has been recorded during the use of these gases in combination."

Quoting Luke, "The safest anæsthetic of which we know at the present time."

Gatch, "It would be foolish to assert that there is no danger. The danger lies, however, not at all in the anæsthetic but entirely in the way it is given. We have had no fatalities attributable to the anæsthetic."

And lastly, Teter, "There has been but very little division of opinion in regard to nitrous oxide and oxygen being the safest anæsthetic known."

Practicability is included in the possibility of its administration by the average person and the ability to make use of it in the great majority of cases.

An apparatus regardless of design depends upon the essential fact that nitrous oxide properly combined with oxygen is capable of producing complete unconsciousness combined with moderate muscular relaxation. The success of the anæsthesia depends upon the dexterity with which the administrator utilizes the particular apparatus under his control.

Nitrous oxide oxygen anæsthesia has been used for practically every operative procedure.

We may now consider more fully the question of practicability by a brief examination of factors intimately associated with the administration and by an occasional reference to a tabulated report of 100 non-selected cases of our own.

The extremes of age appear to do well. Our cases ranged from three years to 70 years old. Dr. Teter reports a case of a baby three months old who was anæsthetized for 30 minutes. The operation was circumcision and amputation of a toe. The recovery was complete in 40 seconds when it was put to breast and nursed without ill effect.²

Women are, as a rule, more easily anæsthetized than men. Old and very sick men being, however, an exception to this rule.

The use of morphine and atropine, one-half hour before anæsthesia, is earnestly advocated by the best authorities. Quoting Crile, "Post-operative ether cases, like seasick travelers, are quite oblivious to environment and even pain, but post-operative nitrous oxide patients, being at once in full possession of their faculties, have an unimpaired painful appreciation of operative trauma. This was admirably met by a combination of scopolamine and morphine precedence."

Our own experience is that there is nothing to be lost and everything to be gained by the use of this preliminary medication.

The induction of anæsthesia by the use of nitrous oxide and oxygen is rapid. Loss of consciousness occurs in from 30 to 50 seconds. The preliminary use of morphine and atropine accelerates the induction of anæsthesia and increases its profundity. The excitement which is prone to occur without its use is minimized and often entirely obviated.

In some cases, particularly the full blooded and muscular, it is impossible to secure sufficient muscular relaxation by the use of nitrous oxide and oxygen alone. This difficulty is practically limited to laparotomies. For these cases there is a device whereby ether may be added by the drop method and directly mixed with the nitrous oxide. The great majority of all cases may be satisfactorily handled by this method.

That ether is not essential for the maintenance of satisfactory anæsthesia was emphasized by a recent case not included in the report. This was a case of ruptured male urethra secondary to an apparently congenital stricture of the external urinary meatus. A large amount of urine had

¹ Hewitt. p. 604. III. Edition.

² Teter. Nitrous Oxide and Oxygen. p. 7.

extravasated into the scrotal and abdominal tissues. An internal urethrotomy was done by perineal section. The manipulation was so strenuous that at times the patient's buttocks were fairly lifted off the table. Some movements of the limbs occurred, but the patient remained entirely under control.

The operation lasted one hour. Absolutely no ether was given and recovery was complete within two minutes.

The respiration under this form of anæsthesia is usually deep and full. The method of re-breathing which we have used has a tendency to stimulate the respiratory centers by the carbon dioxide content present.

One peculiar and fortunate feature of this form of anæsthesia is that its efficiency apparently improves with the duration of the administration. Our own cases have ranged from 15 minutes to three hours and forty-three minutes.

The expense of the administration depends entirely upon the form of apparatus used and whether or not re-breathing is allowed. This expense will vary from about 80 cents to \$7 an hour according to the mode of administration. The expense, however, is no index to the efficiency of the apparatus. Our machine is the type which has been used at Johns Hopkins for a successful series of over 2,500 cases. The expense of running this apparatus averages about 75 cents an hour. In the series of 100 cases appended to this paper the gas and oxygen used was weighed in every case and the cost of the various administrations can be seen at a glance.

We have used nitrous oxide oxygen anæsthesia for almost every variety of operation with the exception of those about the mouth and nose.

Forty-five per cent. of our cases were laparotomies, five of these being abdominal hysterectomies.

A number of features of practical interest must be omitted in a necessarily brief paper. Those who are interested in further details of administrative technique are referred to our chart and bibliography.

It might now be well to pass on to a somewhat broader consideration of this form of anæsthesia. All have their disadvantages, nitrous oxide oxygen anæsthesia is no exception.

The disadvantages which we have found may be summarized as follows:

- A. The necessary skill requires experience.
- B. The apparatus is cumbersome.
- C. There is occasionally incomplete muscular relaxation.
- D. There is a somewhat increased venous hemorrhage.
- E. Operations upon the nose and throat where relaxation and prolonged anæsthesia are desirable are not as yet satisfactory.

It will be interesting to consider these disadvantages separately and to sum them up as

obstacles to the use of nitrous oxide oxygen anæsthesia.

It seems to be the opinion of those who have worked with this anæsthetic that it is not suitable for installation in a general hospital where the administration is in charge of the junior interne. The universal opinion is that it is by far the most difficult anæsthetic to administer. This because of its necessary concentration and the rapidity with which one stage supplants another.

Freedom from respiratory obstruction and the addition of sufficient oxygen is essential to safety and success. The administration of nitrous oxide is best left to those who are sufficiently interested in this line of work to devote the necessary time to it.

That the apparatus is cumbersome is but a question of convenience. The weight of the gas cylinders form the chief objection. The apparatus can be carried anywhere, however, and set up at short notice.

The question of muscular relaxation forms one of the chief objections. This in the great majority of cases can be successfully combated by the preliminary use of morphine and atropine, with the addition of a little ether just before the relaxation is desired. Those cases in which gas and oxygen are especially indicated, namely, the feeble and the septic, usually present no difficulty.

Under the influence of this anæsthetic there is increased blood pressure. The gravity of this condition depends very largely, however, upon the amount of cyanosis which is permitted and upon the degree to which re-breathing is allowed. When properly administered there is practically no cyanosis and the venous hemorrhage is of little or no consequence.

Up to date we have not perfected the administration of this anæsthetic for operations about the nose and throat. It has been done, however, and is being done in Cleveland with considerable success.³

The necessary skill being allowed, including the ability to prevent cyanosis with consequent high blood pressure and the undoubted willingness of the administrator to carry the apparatus, the only real objection to this form of anæsthesia for all operations excluding those upon the nose and throat is the tendency to persistent muscular rigidity in perhaps 5 to 8 per cent. of all cases.

We may now with fairness answer the question, Why use nitrous oxide and oxygen as an anæsthetic?

We may first of all enumerate our reasons for the choice of nitrous oxide and oxygen as an anæsthetic and follow this enumeration by a brief elaboration of each argument.

This form of anæsthesia is advisable in many cases because:

- A. It is safe.

³ Teter. Nitrous Oxide and Oxygen. p. 7.

B. The natural immunity is not affected, nor is the blood harmfully disturbed.

C. There is no tendency to light up a latent tubercular foci as in the case of ether.

D. There are no known bad after effects upon the lungs, kidneys or any other part of the body.

E. By the method of rebreathing, the presence of carbon dioxide acts as a stimulant to the vasomotor center, preventing shock and reducing a rapid pulse.

F. By the method of rebreathing the body temperature is preserved.

G. Oxygen, the best resuscitator, is an integral part of the apparatus.

H. The induction is rapid and pleasant.

I. The recovery is almost immediate and is remarkable chiefly for the absence of symptoms.

J. Without removing the face piece, ether may be given by the most approved method.

K. The absence of post-operative sickness insures early nourishment and a short convalescence.

At the present time as far as can be ascertained nitrous oxide and oxygen anæsthesia is the safest form of anæsthesia yet devised.

Hewitt of London says that "There is no form of anæsthesia at present known which is so devoid of danger as that which results from nitrous oxide when administered with a sufficient amount of oxygen to prevent all asphyxial complications."⁴

According to Hamburger and Ewing whose researches can be found in the preliminary report of the Anæsthesia Commission of the American Medical Association, when ether is administered to a patient for even a short operation there is a reduction in the color index which is progressive, reaching its lowest point about the fifth or sixth day. The volume index also shows a drop which is most marked in the first 24 hours and again on the fifth to the seventh day.

With nitrous oxide the only sign of a low color index is found immediately after the mask is removed and disappears completely in two hours.

The volume index is not affected.

It has been recognized for some time that ether increases the toxemia arising from infection. This has recently been shown to be due to the fact that ether impedes the functional activity of the leucocytes, that it lessens the resisting power to infection which normally exists.

Nitrous oxide produces no such deleterious effect and consequently increases the chances of a septic case.

The recent work of Dr. Gatch of Baltimore, based upon the experiments of Professor Henderson and others, indicates the value of rebreathing.⁵ Shock has been experimentally produced by over-aeration of the blood, that is, by diminishing the carbon dioxide content, and con-

versely it has been relieved and prevented by the additional of CO₂.

The method which we have used is that employed by Dr. Gatch. Over 2,500 cases have been anæsthetized by this method at Johns Hopkins. This method allowing of rebreathing, is not only of advantage by increasing the carbon dioxide present but also by preserving the body temperature from reduction by the expired air.

It has been found that latent T.B. foci will light up under ether anæsthesia.⁶ Those patients who are suspected of having tuberculosis in a quiescent form should have the advantage of nitrous oxide anæsthesia which, as far as can be determined, is harmless in this respect.

From the standpoint of the patient, this form of anæsthesia is ideal. He becomes unconscious almost at once and upon his recovery is often not even nauseated. This satisfactory state of affairs does not end here, for frequently he can take nourishment at once and as a consequence of this he may leave the hospital at an earlier date. Post-operative abdominal distension is remarkable chiefly for its absence. The innocuousness of the anæsthetic combined with the stimulant action of the carbon dioxide present, allows the intestinal musculature to retain its normal tonicity.

Oxygen, which is the best antidote for overdosage of nitrous oxide, is constantly at hand. The administrator has but to turn on a valve to secure a pure atmosphere of this gas.

When marked muscular rigidity persists it is advisable to add a little ether. It appears from special research along these lines by Dr. Gatch,⁷ that many of the ill effects of ether are due to a lack of oxygen and the fact that it is being given in too great concentration. According to Gatch ether should not be given in a concentration of over 7 per cent. The increased pulmonary ventilation which is secured by rebreathing allows of a rapid absorption of this dilute ether vapor with the minimum amount of harm to the tissues and a maximum saturation of the blood.

The possibility and ease with which oxygen may be added in conjunction with this dilute ether disposes of the remaining objection to the use of the closed method, namely, anoxemia or deoxygenation of the blood.

Ether given by the open or drop method is safe because the low temperature brought about by its evaporation limits the rapid evaporation of further ether dropped on the mask.

The objection to this method, however, lies in the fact that the rate of respiration being increased, the amount of carbon dioxide thrown off is excessive, resulting in shallow breathing and frequently apnea. This condition reacts upon the quality of the heart action and frequently results in various degrees of surgical shock.

⁴ Hewitt. p. 320. Edition III.

⁵ W. B. Gatch. J. A. M. A. Mar. 5, 1910.

⁶ J. Walsh. J. A. M. A. Vol. LIII. p. 683.

⁷ W. D. Gatch. J. A. M. A. Nov. 11, 1911.

In order to overcome these physiological difficulties the practice of rebreathing is advocated.

In conclusion I would reiterate the following indications for the use of nitrous oxide and oxygen:

Where sepsis is present or suspected.

The extremes of age.

Those whom we are anxious to shield from the usual discomforts of ether anaesthesia.

The tubercular.

If we may be allowed to quote Parker of Cleveland, "An experience of seven years has convinced me that nitrous oxide and oxygen can be safely administered in every case however desperate the condition where any operative interference is justifiable."⁸

⁸ Teter. Nitrous Oxide and Oxygen. p. 8.

KEY TO CHART.

- Age and Sex.—Explain themselves.
- M&A.—Morphine and atropine.
- Anaes.—Depth of anaesthesia secured. Light (1), moderate (2), complete (3).
- Excit.—Degree of excitement present. Absent (o), slight (1), moderate (2), marked (3).
- Rel.—Degree of relaxation present. Little (1), moderate (2), complete (3).
- Resp.—Character of the respiration. Irregular (Ir), deep (D), obstructed (Ob), shallow (S).
- Col.—Color. Normal (N), flushed (F), cyanosis predominating (C), alternately flushed and cyanotic (C&F).
- T.—Time of administration.
- Gas.—Nitrous Oxide used in gallons.
- O.—Oxygen used in gallons.

- E.—Ether, dram (Dr.), ounces (Oz.).
- Vom.—Vomiting.
- Operation.—Is self explanatory.
- Results.—Failures are recorded as such.
- Satisfactory Cases.—Surgeon's standpoint.
- Successful Cases.—Anaesthetist's standpoint.
- Complete Success.—The ideal cases.

SUMMARY OF CHART.

- Youngest 3, oldest 70; 76 per cent females.
- Morphine and atropine in 63 per cent.
- Total time of administration 103 hours.
- Nitrous oxide used, 3470 gals.; O used 768 gals.
- Average cost per case without hospital discount, \$1.08 per hour and per case.
- With discount, \$0.70 per hour and per case.
- No ether given in 19 per cent. of the 100 cases.

Age	Sex	M&A	Anaes.	Excit.	Rel.	Resp.	Col.	T.	Gas	O.	E.	Vom.	
1	60	Fe	o	1	3	1	Ir&D	F	20	..	o	4	
2	21	M	o	3	o	3	R&D	N	20	..	Dr. 1	2	
3	32	Fe	o	1	3	1	Ir&D	F	15	105	Dr. 1	2	
4	26	M	o	1	3	1	Ir&D	F	15	..	Dr. 1	o	
5	13	Fe	o	2	2	2	Ir&D	N	20	..	Dr. 1	4	
6	33	Fe	o	2	2	2	R&D	N	15	..	o	o	
7	26	M	o	2	1	2	R&D	N	20	..	Dr. 2	o	
8	35	Fe	o	3	1	3	R&D	N	30	..	Dr. 2	o	
9	35	Fe	1/6&1/150	1	1	1	Ir&D	C&F	15	95	Dr. 2	5	
10	64	Fe	o	1	3	1	Ir&D	C	15	..	Dr. 3	o	
11	49	Fe	1/6&1/150	3	1	2	R&D	N	1.30	..	o	o	
12	23	Fe	1/6&1/150	2	1	1	Ir&Ob	N	1.00	32	Oz. 2	2	
13	15	M	o	2	1	1	Ir&Ob	C	50	..	Oz. 1	o	
14	13	Fe	o	2	2	2	R&D	N	30	..	Dr. 1	5	
15	17	Fe	1/8&1/300	2	2	2	IR&D	C	30	..	Dr. 1	5	
16	42	Fe	1/8&1/300	3	3	3	R&D	N	1.55	70	Dr. 2	o	
17	46	M	1/8&1/300	3	2	3	R&D	C	1.10	38	Dr. 2	o	
18	18	Fe	o	2	3	2	Ir&D	N	25	20	3	Dr. 2	2
19	3	Fe	o	2	2	1	R&D	N	15	28	1	Dr. 1	o
20	37	Fe	1/8&1/300	3	o	3	R&D	N	50	27	11	Dr. 1	o
21	25	M	o	1	3	1	Ir&D	F	15	40	3	o	o
22	3	Fe	o	2	2	2	R&D	N	1.05	58	16	Dr. 1	2
23	56	Fe	1/4&1/150	3	o	3	R&D	N	1.17	18	11	Dr. 2	o
24	40	Fe	1/8&1/300	3	o	3	Ir&Ob	C	2.30	58	11	Dr. 2	o
25	29	M	1/4&1/150	3	1	2	R&Ob	C	1.45	50	9	Dr. 2	o
26	25	Fe	o	2	2	2	Ir&Ob	N	20	16	3	Dr. 2	3
27	25	M	1/4&1/150	2	2	1	Ir&Ob	C	1.40	..	..	Oz. 2	o
28	45	M	1/4&1/150	3	1	3	R&D	N	1.15	68	9	Oz. 1	o
29	26	Fe	1/4&1/150	3	1	3	R&D	N	1.33	38	9	Dr. 2	o
30	35	Fe	1/4&1/150	3	o	3	Ir&Ob	C&F	3.42	54	45	Oz. 2	1
31	27	Fe	1/4&1/150	3	1	3	R&D	N	2.00	74	9	Oz. 1	o
32	36	Fe	1/4&1/150	3	1	3	R&D	N	1.20	34	9	Dr. 1	o
33	23	Fe	o	2	2	3	Ir&D	N	30	24	9	Dr. 1	o
34	50	Fe	o	2	1	2	Ir&D	N	50	24	9	Dr. 2	2
35	27	Fe	1/8&1/150	3	o	3	R&D	N	1.15	50	19	Oz. 2	o
36	63	Fe	o	3	1	3	R&D	N	1.15	40	14	Dr. 3	o
37	49	Fe	1/4&1/150	3	1	3	R&D	N	2.00	..	..	Dr. 3	o
38	23	M	1/4&1/150	2	3	1	Ir&Ob	C	1.00	143	40	Oz. 2	o
39	24	Fe	1/4&1/150	3	o	3	R&D	N	2.30	..	..	Dr. 2	o
40	35	Fe	1/4&1/150	3	o	3	R&D	N	20	26	3	Dr. 2	o
41	30	Fe	1/4&1/150	2	2	2	Ir&D	N	30	..	..	Oz. 1	2
42	45	Fe	o	3	o	3	R&D	N	15	8	1	o	o
43	49	Fe	1/4&1/150	3	o	3	R&D	N	1.40	36	11	Oz. 1	o
44	50	M	o	2	3	2	R&D	C&F	15	36	9	Dr. 2	o
45	24	Fe	1/4&1/150	3	o	3	R&D	C&F	1.32	66	22	Dr. 2	o
46	5	Fe	o	2	o	2	R&D	C	1.30	..	..	Dr. 4	o

Age	Sex	M&A	Anaes.	Excit.	Rel.	Resp.	Col.	T.	Gas	O.	E.	Vom.	
47	30	Fe	1/4&1/150	3	2	2	R&D	C	2.00	70	11	Oz. 1	0
48	24	Fe	1/4&1/150	2	3	2	Ir&Ob	C	30	60	14	Dr. 2	0
49	42	Fe	1/4&1/150	2	3	2	Ir&D	N	20			Dr. 1	0
50	35	Fe	o	2	0	2	R&D	N	15			o	0
51	12	Fe	o	3	0	3	R&D	N	1.20	52	3	o	0
52	28	M	1/4&1/150	2	0	3	R&D	N	55	44	11	Dr. 2	0
53	41	Fe	1/4&1/150	3	0	3	R&D	N	1.25	50	6	Dr. 4	0
54	30	Fe	1/4&1/150	3	1	3	R&D	N	55	30	5	Dr. 2	3
55	27	Fe	1/4&1/150	3	1	2	Ir&Ob	C	1.20	104	28	Dr. 6	0
56	22	M	1/4&1/150	2	3	2	Ir&Ob	N	1.15			Oz. 1	0
57	23	M	1/4&1/150	2	2	2	Ir&Ob	C&F	38	38	8	Oz. 3	0
58	56	M	1/4&1/150	3	2	3	R&D	C&F	3.23	96	35	Oz. 4	2
59	35	Fe	1/4&1/150	2	0	1	Ir&Ob	C	1.10	94	17	Oz. 2	0
60	54	M	1/4&1/150	3	2	3	Ir&D	C	1.20			Dr. 4	0
61	29	Fe	o	3	0	3	R&D	N	20	14	1	o	0
62	55	M	1/4&1/150	2	2	2	Ir&Ob	N	1.35	80	17	Oz. 2	3
63	33	Fe	1/4&1/150	3	0	3	R&D	N	1.00	38	5	Dr. 4	0
64	35	Fe	1/4&1/150	2	3	2	Ir&Ob	C	2.18	70	35	Oz. 6	0
65	17	Fe	1/4&1/150	2	0	2	R&D	F	1.11	54	8	Oz. 2	0
66	24	Fe	1/4&1/150	3	1	3	Ir&D	N	1.35	66	11	Oz. 1	0
67	49	Fe	1/4&1/150	3	1	3	Ir&Ob	C	1.55	72	8	Oz. 2	1
68	28	Fe	1/4&1/150	3	0	3	R&D	N	25	22	2	Dr. 1	0
69	6	M	o	2	3	1	Ir&D	N	15	14	1	o	0
70	27	Fe	1/4&1/150	3	3	2	R&D	N	1.00	48	6	Dr. 10	0
71	31	M	1/4&1/150	1	3	1	Ir&Ob	C&F	10	7	3	o	0
72	49	Fe	1/4&1/150	3	1	3	R&D	N	2.05	55	16	Dr. 2	0
73	45	Fe	1/4&1/150	3	1	3	Ir&Ob	N	2.15	65	11	Dr. 2	0
74	28	Fe	o	3	0	3	R&D	N	30	26	4	o	0
75	30	M	1/4&1/150	3	2	3	R&Ob	C	50	50	22	Oz. 2	0
76	15	M	1/8&1/300	3	0	2	R&D	N	1.00	24	5	o	0
77	21	Fe	1/8&1/300	3	0	2	Ir&Ob	C&F	1.17	50	14	Dr. 1	0
78	28	Fe	1/4&1/150	3	0	3	R&D	N	1.08	46	6	Dr. 4	0
79	35	Fe	o	1	3	2	Ir&Ob	C&F	40	32	5	Dr. 5	0
80	24	Fe	1/4&1/150	2	2	2	Ir&Ob	N	1.15	42	11	Oz. 1	0
81	50	M	1/4&1/150	3	0	2	Ir&Ob	N	2.15	72	40	Oz. 4	0
82	24	M	1/4&1/150	3	0	2	R&D	N	40	48	2	o	0
83	12	Fe	1/8&1/300	3	0	2	R&D	N	20	10	2	Oz. 3	0
84	9	M	o	2	1	2	R&D	N	30	20	3	o	0
85	50	M	1/4&1/150	2	1	3	R&D	N	42	38	5	Dr. 3	0
86	52	M	o	2	1	2	R&D	N	20	20	2	o	0
87	26	Fe	1/4&1/150	2	2	1	Ir&D	N	..	..	..	..	..
88	30	Fe	o	2	2	2	Ir&D	N	1.00	38	10	Oz. 1	1
89	25	M	1/4&1/150	2	1	2	R&D	N	1.55	94	11	Oz. 2	0
90	43	Fe	o	2	3	1	Ir&D	N	40	28	3	Oz. 2	0
91	45	Fe	1/4&1/150	3	1	3	Ir&S	N	2.50	104	47	Oz. 2	0
92	55	Fe	o	3	1	3	R&D	N	1.10	46	11	Dr. 1	0
93	25	M	1/4&1/150	3	2	3	R&D	N	2.15	58	10	Oz. 1	0
94	28	M	1/4&1/150	2	2	2	Ir&D	C&F	..	..	..	..	..
95	70	Fe	o	3	0	3	R&D	N	25	42	5	o	0
96	36	Fe	o	3	0	3	R&D	N	50	44	11	o	0
97	47	M	o	3	0	3	R&S	N	1.00	40	44	o	0
98	6	Fe	o	3	1	3	R&D	N	1.00	32	8	o	0
99	18	Fe	1/4&1/150	3	1	2	Ir&D	N	50	34	8	Oz. 2	0
100	47	Fe	1/4&1/150	3	1	2	R&D	N	50	30	8	Dr. 4	1

Operation.	Results.	Operation.	Results.
1 Joint examination.	Failure.	20 Pus appendix.	Complete success.
2 Joint examination.	Complete success.	21 Fracture of humerus.	Failure.
3 Laparotomy.	Failure.	22 Glands of neck.	Success.
4 Hernia.	Failure.	23 Int. obstruction, pyo salpinx.	Complete success.
5 Suturing lacerated lip.	Satisfactory.	24 Hysterectomy.	Satisfactory.
6 Appendectomy.	Failure.	25 Trepine of fractured skull.	Satisfactory.
7 Incision, T.B. abscess of thigh.	Success.	26 Needle in thumb.	Satisfactory.
8 Secondary appendectomy	Complete success.	27 Exploratory laparotomy.	Satisfactory.
9 Hysterectomy.	Failure.	28 Fracture of tibia, set.	Complete success.
10 Femoral hernia.	Failure.	29 Curettage, trachelorrhaphy lapa- rotomy.	Complete success.
11 Cauterization of cancerous cer- vix.	Complete success.	30 Hysterectomy.	Complete success.
12 Appendectomy.	Satisfactory.	31 Curettage, trachelorrhaphy, peri- neum appendectomy and ant. suspension.	Complete success.
13 Appendectomy.	Success.	32 Removal of cyst of broad liga- ment.	Complete success.
14 Sebaceous cyst of neck.	Satisfactory.	33 Removal of auxillary glands.	Complete success.
15 Glands of neck.	Satisfactory.	34 Needle in foot.	Complete success.
16 Left nephropexy, salpingo ova- riectomy.	Success.	35 High forceps.	Complete success.
17 Appendectomy.	Satisfactory.	36 Modified Gilliam operation.	Complete success.
18 Needle in hand.	Satisfactory.		
19 Foreign body in ear.	Satisfactory.		

deed, it bore a striking resemblance to this interesting animal.

We sent a sample of the stool by messenger to Dr. Anna Stuart. Although it was a cold night and the boy was delayed an hour, Dr. Stuart was able to revive the organisms by heat so that she could observe them very well. Indeed she kept them alive at one time (during a subsequent examination) for a week. She identified them as the *balantidium coli*.

Balantidium is an infusorian (a distinguishing characteristic of the infusoria being that they are ciliated). It belongs in Order II which has cilia distributed over the general surface and an adoral zone. It is not generally regarded as pathogenic although it may cause an obstinate diarrhoea. McFarland classifies *balantidium coli* among the infusorias and states that it is not certainly parasitic but perhaps merely "commensal." That is, it inhabits the body of its host but without any effect on the host, either detrimental or advantageous.

Nevertheless its occurrence in the stools of this patient in such large numbers (we found dozens in one field) forced the query "May it not in some way be the cause of the anemia in this patient?"

In a conversation over the telephone with Prof. C. W. Stiles of Washington, Prof. Stiles stated that he knew of no case in the literature or in his own observation where *balantidium coli* was shown to be the cause of pernicious anemia. He did, however, very kindly advise colonic washing and suggested that we endeavor to change the reaction of the stools, that is, if they were acid to render them alkaline and the reverse. He also sent a monograph on *balantidium* which he said was all the literature he could find on the subject. A careful reading of this fails to afford sufficient ground for classing the *balantidium* as pathogenic, certainly not as a cause of pernicious anemia.

Not deterred, however, by these adverse reports we decided to treat the case on the theory that *balantidium coli* was the cause of our patient's anemia. The reason is obvious,—we could find no other explanation of his condition. It seemed to be the only straw held out to a drowning man. Accordingly he was plied with arsenic by the mouth, also thymol and other drugs of similar class, also by enemata of quinine solutions and so forth. Whether as a result of the treatment or only a sequel he soon began to improve and made apparently a good recovery. At the same time *the organism disappeared from the stools*.

Now of course it is a well known fact that pernicious anemia is apt to be attended by periods of improvement succeeded by a relapse, but a permanent recovery is very rare. Is not that very fact suggestive of infection with some form of parasitic organism? At any rate our patient

proved no exception to the rule. He suffered a relapse. The relapse was more severe than the first attack. The count of red cells fell to the lowest point shown in any of his attacks (now numbering three or four) namely 550,000. This was in February of this year. The hemoglobin was 12%. Color index 1.19. Megalocytes, schistocytes, microcytes, poikilocytes all numerous. Normoblasts none. Normocytes none. Leucocytes normal.

At this time Dr. G. V. R. Merrill of this city who had not long ago had some experience with a somewhat similar case was asked to see the patient in consultation. Dr. Merrill concurred in the diagnosis of pernicious anemia and advised the continuance of arsenic but in larger doses and by hypodermic. This plan was carried out and again the patient improved. In fact he made so good a recovery that not long afterward I met him (somewhat to my surprise) at a dinner given by a certain club in the city. He then appeared to be in very good health although still rather pale.

About this time I received in the mail a monograph by Dr. John M. Swan of The Glen Springs Sanitarium at Watkins, New York, with the title "Some Remarks on Intestinal Parasites," from which I take the liberty to quote very briefly. Speaking of the *trichomonas intestinalis*, which although not the same as *balantidium* yet is also a protozoan of close relationship, the author says "It is commonly supposed to be a harmless parasite productive of no symptoms. In the two instances in which it was found both patients were anemic. One patient had a classical picture of progressive pernicious anemia of which she died, and the other had a simple secondary anemia. In the case of a boy whom I saw in the children's medical dispensary of the Presbyterian Hospital in 1906 indefinite symptoms and an anemic appearance led to a blood examination; the finding of 8.6 per cent. eosinophile cells led to an examination of the feces which showed a marked infection with *trichomonas intestinalis*. The disappearance of the parasites from the feces was followed by an alleviation of the symptoms and the return of a normal blood picture. The presence of this parasite in the feces is sometimes attended by symptoms, especially by anemia. I think the possible relationship between the two is worth further investigation."

Dr. Swan in this pamphlet states that an eosinophile percentage of over 4% is sufficient to call for an examination of the feces.

In a paper read by S. M. Shook, M.D., before the Medical Society of the State of New York and reprinted in this *Journal*, September of this year, Dr. Shook speaks of *balantidium* infection as follows: "Infections with small numbers of *balantidia* may cause no symptoms, but heavy infections may cause recurring attacks of diarrhoea, or severe dysentery with death following

from a secondary infection, or from exhaustion." No mention is made of anemia or pernicious anemia as a sequel in the reprint.

With regard to the pathology of balantidium infection there is evidence to show that the organisms penetrate the deeper layers of the intestinal mucosa. This is spoken of in a paper read by Fred S. Bowman, of the Biological Laboratory at Manila before the eighth annual meeting of the Philippine Islands Association in February, 1911. The paper was entitled "Studies in Balantidium Infection." Quoting from the report in the *Medical Record* April 22, 1911: "The author gave the history of two cases which had resulted in death and stated that the prognosis in this disease was bad even when treatment was begun early, and absolutely hopeless in the latter stages of the disease. He showed a series of lantern slides in which the organisms were shown by sections to be in the deeper layers of the intestinal mucosa."

Perhaps it may not be amiss to state that in the case of our patient Dr. Stuart in repeated examinations of the blood found no organism of this kind or any other in the blood.

Since this paper was written there has been another typical attack or recurrence of the anemia and at the same time *pari passu* with the development of the anemia a new generation of balantidia grew and multiplied as before until the stools were "alive with them." At the same time the administration of arsenic was begun and continued in large doses until pronounced symptoms of arsenical poisoning developed. Then the arsenic was necessarily discontinued. During the whole of the recurrence regular daily flushing of the colon was kept up. As before the balantidia began to diminish in number and the blood count of red cells began at the same time to improve until finally, when the balantidia disappeared almost if not entirely from the stools of the patient began to feel better and his color improved and he was soon sitting up, then getting out of doors and this recurrence was over.

Is not this case strongly suggestive of an etiological connection between the balantidium infection and the pernicious anemia?

With regard to treatment, I attach great value to regularly repeated colonic irrigation and am inclined to attribute any good result we obtained to the washing rather than to any drug used. A great deal of the time we used normal salt solution and apparently with as good satisfaction as when quinine or other drug was put in the water. Some writers recommend methylene blue, 1 to 3,000. As to the method of administering arsenic we did not make use of any of the recent German preparations such as salvarsan, although tempted to do so. On this subject of treatment Prof. Stiles in a recent letter says "Quinine is one of the best drugs to be used against protozoa and arsenic is of use in some instances."

DIAGNOSIS AND SYMPTOMS OF DISEASES OF THE LIVER.*

By JEROME MEYERS, M.D.,

ALBANY, N. Y.

OUR knowledge of the symptoms of diseases of the liver may be classified under two heads, first, what we do know about the liver, and secondly, what we do not know about the liver. We do know that there are certain well-defined hepatic syndromes, such as acute yellow atrophy, pernicious vomiting of pregnancy, acute suppurative hepatitis and abscess, we do know that the liver detoxifies the blood brought to it by the portal system, warehouses sugar from the carbohydrates, the proteins, and the fats in the form of glycogen, acts as a fat depot, breaks down higher fatty acids and forms urea from the ammonium compounds, aids in the final formation of amino-acids from proteins, and manufactures and excretes bile. So much of certain conditions and of the physiology of the liver we know; what we do not know are the early clinical manifestations of disordered hepatic function in the chronic lesions, such as the various cirrheses, carcinoma, or syphilis. These chronic lesions are simple of diagnosis on the autopsy table or under the microscope; it is not so easy to determine unquestionable hepatic disease in the living. Furthermore, the liver is so intimately related, both anatomically and functionally, with other organs both in the abdomen and the thorax, that genuine hepatic disorganization in its early stages may masquerade as gastro-enteric disease, and conversely, gastro-enteric, cardiac, or hematogenic disturbances may make the liver the principal scene of many of their symptoms. There are complex relations between the liver, the thyroid, and the pancreas as regards the glycogenic function, between the liver and pancreas in diabète bronzé, or even in simple cirrhosis; there are connections between toxic blood conditions, the spleen and the liver in cirrhosis; the pericardium, the pleuræ, the capsule of the spleen, the Glisson's capsule may be similarly affected in the various forms of polyserositis. Necroses of the hepatic parenchyma have been found in eclampsia, and acute yellow atrophy is not seldom associated with pregnancy or the puerperium. The question of typhoid, of the excretion of the Eberth bacillus in the bile, of its prolonged habitat in the gall-bladder, of the formation of gall-stones with their many-faceted symptoms and results, all these problems are contained in the total of our knowledge and ignorance of the symptoms and diagnosis of hepatic lesions.

Accordingly, it has seemed advisable, instead of detailing individual symptoms or reiterating well-known differential diagnosis, to attempt to

* Read before the Medical Society of the County of Albany, at Albany, January 9, 1912.

place before you some clinical methods for the determination of hepatic impairment or integrity. When hepatic disease is once established, the symptoms are usually sufficiently prominent not to escape ordinary attention. When they are prominent, however, little can be done in the way of restitution or cure, except in purely limited surgical lesions. It is therefore highly important to know what possible means we can employ to estimate the functional power of the liver, and thereby, its anatomic condition. The following brief report of a case will serve to introduce the procedure of hepatic diagnosis:

Mr. X, 39. Mother has diabetes. Father died of chronic nephritis, sister of pulmonary tuberculosis. A very moderate user of alcohol. Lues denied. For last two years, has had feeling of heaviness and malaise after eating, sometimes lasting all day. Some vertigo when lying down after eating. Appetite very poor in morning. No nausea or vomiting or pharyngitis. Does not feel rested at any time. Intestinal movements fairly regular.

Physical Examination. Slight yellow tinge of sclera toward outer canthus. Stomach normal in size, position and form. Test-breakfast of normal composition with free HCL of 50 degrees, total acidity of 68 degrees. The spleen is not palpable or enlarged. The lower border of the liver, in the mammary line, is one-half inch above the free margin of the ribs. Systolic blood tension with Tycos instrument varies between 130 and 140. Feces give nothing abnormal. Urine shows a mild chronic nephritis. The first specimen of urine examined gives a slight reaction for urobilinogen in the cold, the next is negative, then a slight reaction, again a slight, then three specimens each with a negative reaction.

Owing to the character of the symptoms, the negative gastric findings, and the presence of urobilinogen, the patient was given on the fasting stomach at breakfast-time 100 gm. of pure levulose, and the urine collected in hourly portions for six hours. Three of these portions, the third, fourth, and fifth passed, showed a positive reaction for levulose with Seliwanoff's solution, one of these portions gave a positive reaction with Fehling's solution, the other two questionable reactions. Based on these findings, a diagnosis of impairment of the hepatic parenchyma was made; in consideration of the diminution in the size of the liver, we may assume a slight cirrhosis. Indicated treatment by proper diet and small continued doses of KI together with the syrup of hypophosphites later have given very satisfactory results, the urobilinogen and casts have disappeared for the last three specimens of urine examined, and the patient has lost his unpleasant subjective sensations.

There are then in hepatic diagnosis two procedures, first, the determination of the presence or absence of urobilinogen in the urine, involving

as we shall see the bile-forming function of the liver, second, the presence in the urine of levulose, involving its glycogenic function.

First, then, as to urobilinogen. This is demonstrated by the so-called Ehrlich's aldehyde reaction, performed by the addition of a few drops of a 2% sol. of dimethylamidobenzaldehyde in conc. HCL to 2-3 ccm. of fresh unheated urine, a positive reaction consisting of a faint rose-red to a scarlet-red coloration. Marked reactions are of more worth than slight ones, and the contents should be viewed close to the eyes, and not by reflected light as then the reddish color is apt to be falsely accentuated. The specimen should be fresh as the urobilinogen disappears rapidly, due possibly to some enzyme in the urine. While slight reactions are not so important as marked ones, it must still be said that many urines give absolutely no reddish tinge.

The diagnostic value of urobilinogen in the urine rests upon the following considerations: The liver cells elaborate bile in the form of bilirubin, which as it passes through the alimentary canal is changed to bilirubin, which in turn, in the large intestine is transformed to hydrobilirubin which is the same substance found in the urine as urobilinogen. Part of the hydrobilirubin found in the large intestine enters the portal system and is carried to the liver cells, which, if they are normal, absorb the hydrobilirubin from the blood and pass it on again into the duodenum. If, however, the liver cells are diseased, or if, for any reason, the hydrobilirubin is not taken out of the portal circulation, but instead passes through the liver into the general circulation, and is excreted by the kidneys, it can be found in the urine as the so-called urobilinogen. Viewing therefore these physiological phenomena constituting what we may term the biliary circulation, we can see that, when the liver cells are compromised in cirrhosis, or when the proper physiological conditions are disturbed as in obstruction to the outflow of bile, be it through stone, or neoplasm, or catarrh anywhere in the biliary ducts, we may find this pathological constituent in the urine. In obstruction, or catarrhal conditions, it is very possible that changes in intrahepatic pressure prevents the proper absorption of hydrobilirubin with a consequent urobilinogenuria. With complete obstruction, we find no bilirubin in the intestine, and naturally therefore no urobilinogenuria. In incomplete obstruction and moderate to severe jaundice we may find bile in the intestine with no urobilinogenuria.

Secondly, then, as to levulosuria, which concerns the glycogenic function of the liver. It is well-known that both infants and adults digest and assimilate certain sugars better than others. It has been found that dogs, from whom the liver has been removed, show a lessened tolerance for levulose, but not for dextrose, galactose, or arabinose. Clinically, it has been shown that

healthy as well as diabetic subjects have a greater tolerance for levulose than for dextrose, but that subjects with hepatic disease cannot assimilate the same quantity of levulose as a healthy subject can; that is, the unassimilated levulose will appear in the urine. It has been found that 90% of hepatic patients present levulosuria after the ingestion of 100 gm. of levulose. The levulose is given early in the morning on the fasting stomach in 500 cc. of water, and the patient collects hourly specimens for 4-6 hours. If the liver is seriously involved the levulose will appear in the first portion and may persist for 5-6 portions. If only moderate involvement, the levulose may not appear until the fourth, and not again.

We have here then a second valuable means of diagnosis of hepatic sufficiency. It is reliable and more than fairly constant. In conjunction with the test for urobilinogen it gives valuable data. I have followed two cases, both of which showed distinct urobilinogenuria, one markedly so, but in both the levulose test was negative, establishing in both cases a diagnosis of recurrent catarrhal cholangitis, though in one of the cases the liver had been enlarged for some considerable time. Not only are these tests of signal value in diagnosis, but they should be given full trial and consideration in the differential diagnosis of hepatic disease, as it may be a question of cirrhosis, cancer, cholelithiasis or cholangitis. In all these conditions it may be important to establish the presence or absence of bile in the feces. This determination can be made either by the use of Ehrlich's benzaldehyde or of a sat. sol. of $HgCl_2$. The former, by adding a few drops of the agent to a few ccm. of a watery solution of feces mixed with 3-4 ccm. of 70% alcohol, the presence of hydrobilirubin quickly gives a beautiful deep rose-red color. The latter, by adding sat. sol. of $HgCl_2$ to a watery solution of feces, a positive result being a dull brick-red color, occurring soon or after 12-24 hours. A total lack of bile in the second test gives a white coloration; unchanged bile, due to rapid passage through the intestine as in diarrhoea, a green reaction.

These tests are of importance because the appearance of the stool may be very deceptive, blood, food, or drugs may give a dark color when no bile is present, while we may at times have a perfectly white stool that contains the normal quantity of bile, but in the form of leucohydrobilirubin, which however reacts to $HgCl_2$. The stools of infants do not give as marked and definite reactions as those of adults.

These then are a few diagnostic tests which are of greatest importance in disease of the liver, the gall-bladder system, and also the pancreas, especially carcinoma of the head. The urobilinogen test should be done as a routine part of every urinary examination, and when

found in any marked and persistent degree, the levulose test should be employed. In this manner, the diagnosis of hepatic disease can be placed on a more logical basis, earlier diagnosis can be made, and the corollary of early diagnosis, early cure, made at least possible.

THE DANGERS OF SALVARSAN.*

By NELSON W. WILSON, M.D.,

BUFFALO, N. Y.

IN 1908 when Ehrlich announced the completion of his arsenophenylglycerin compound, to which he gave the laboratory number 418, he concluded with these words: "If this particular substance which has answered best up to the present should, perhaps, prove unsuitable for adoption in human pathology, then we must proceed further along the road which now stretches clear before us." Those words, deep-bitten of his belief of success, stand true to-day as applicable to his later and supposedly perfected preparation known popularly as 606, scientifically as dioxy-diamido-arseno-benzene dihydrochlorid, and commercially as salvarsan, insofar as it relates to syphilis.

Salvarsan became generally known early in 1910 by reports from Ehrlich's laboratory where it was prepared by Berthelm and tested by Hata under Ehrlich's supervision. So glowing were these reports of early successes, so brilliant the cures as they were permitted to filter out of the clinics and laboratories of Europe that this mysterious substance 606—mysterious chiefly because of the secrecy surrounding its composition and its fantastic designation—which was to sweep syphilis from the earth, became the center of desire of the profession of the world, legitimate and illegitimate. Frankfort became the mecca of medical men from every country and some of the visitors were permitted to watch the experiments in which Wechselmann and Alt were leaders. There can be no question that in the first flush of experimentation all that was hoped for the new combination appeared to have been achieved. True, there were accidents and even deaths. In the main these were ascribed to combinations of circumstances, not directly traceable to salvarsan. Still the tide of professional interest rose and was accentuated by a popular demand made ripe by magazine and newspaper articles descriptive of the wonderful discovery and its certain cure of syphilis by a single treatment. Some of the most conservative of scientists were gathered up into the whirl of blind infatuation, almost idolatrous in its nature, and unreservedly accepted the preparation and gave voice to their endorsement to news associations for broadcast publication in the daily press. There was, of course, and

* Read before the Sixth District Branch of the Medical Society of the State of New York, at Elmira, October 17, 1911.

rightly, too, generous praise for the genius of Ehrlich; yet underlying all was an insistent demand for access to the drug which was to supersede mercury as a curative agent and rid humanity of one of its most prevalent afflictions.

The demand became an international hysteria which increased when finally announcement was made that 606, now known as salvarsan, would be placed on sale to the profession in the United States on January 1, 1911. Physicians were notified—and even canvassed for orders by agents of the importers—prior to that date. And here was born one of the initial dangers of salvarsan—the over-riding of science by pure commercialism after carefully planned, if gratuitous, newspaper advertising. It was made a public necessity before its scientific worth had been established. The profession at large, blinded by the preliminary reports and the public, in a fever of enthusiasm over the certain cure of syphilis old, new and anticipatory, accepted it freely with blind faith and with little thought of the future and none of the present save the opportunity of the moment. Since then it has been used with lavish hand in all sorts of conditions and in almost every phase of syphilis which has been discovered or imagined since the days of those early Chinese observers who 5,000 years before Christ penned graphic, if crude, descriptions of the various lesions and outlined the treatment of syphilis by inunctions of mercury.

Now came from independent observers in Germany and Russia reports of recurrences after the use of salvarsan. Then the accidents of administration and the more serious sequels which of their very gravity compelled attention. Notes of warning regarding the use of the drug crept into the medical journals and one of the earliest was published in the *Buffalo Medical Journal* when the year was in its infancy. There has been no decrease in these reports and warnings regarding the purely physical dangers of the preparation. Even a cursory reading of the already voluminous salvarsan literature is illuminating. It will take time, a year or more, perhaps, to gather any very definite idea regarding the ills which have followed early misuse of the drug, carelessness in administration and over-enthusiastic diagnosis of ulcerative herpes and balanitis and chancroid as true initial lesions of syphilis born of an eager desire to be one of those to achieve a brilliant result.

In the literature one finds frequent reference to collapse and often death after the use of salvarsan. This is a danger in the general administration which may be averted, but which most frequently cannot be foreseen. We cannot know when a syphilitic has begun the development of a specific myocarditis. This condition in its early stages escapes the most painstaking physical examination and in several of the deaths following salvarsan collapse it has been demonstrated only at autopsy. This, then, constitutes one of

the chief physical dangers—the presence of an unsuspected myocarditis. These collapse cases are not always necessarily fatal if promptly recognized and treated; but when they occur at night death invariably results. This danger is so well recognized that a number of men in this country and Europe administer salvarsan only in the morning and impose constant watching of the patient for the first 24 hours.

Those conditions which one may consider minor results of the use of salvarsan are quite generally known: The effect on the optic nerve; the fact that it positively does not arrest tertiary lesions of the liver; and that its subcutaneous administration causes pain, infiltration and often necrosis and sloughing. In its careless use, intravenously, the broad dangers are thrombosis, phlebitis, lymphangitis and the tearing of the posterior wall of the vessel by the needle. Then, generally, by whatever method of use, there is danger of the development of a scarlatina rash, icterus, nephritis, renal hematuria, renal colic, kidney necrosis, convulsions in cerebro-spinal syphilis, vertigo and those grave ear and nerve affections so frequently reported and which have given rise to the weaving of so many interesting theories. Just what that affinity is which salvarsan has for the nervous system is undetermined, but it is quite likely due to some product of salvarsan in the circulation.

These dangers are not necessarily immediate. They may, and do, develop months after the administration of the drug. In one case of cerebral syphilis, that of a German army officer, salvarsan was given in October, 1910. He died of encephalitis in March, 1911. From Germany epileptiform seizures have been reported as occurring a few days after the administration of the preparation; in one case paralysis of the vocal cords appeared in three days; and the same author reports headaches and paralysis 10 weeks after treatment. A London report calls attention to the serious dangers of relapse in syphilitic meningitis, which is corroborated by a New York investigator, who, after a careful study of salvarsan and its purely physical dangers, definitely declares that symptoms of relapse occur more quickly and more frequently after salvarsan than after mercury. He pleads for a more conservative use of the drug because we are not yet fully informed regarding its dangers.

In a recent issue of the *Journal of the American Medical Association* appeared an abstract which is so graphic in its description of the physical dangers encountered in the use of salvarsan that it is of particular interest in this connection:

“Among the fourteen syphilitics whom Boas treated with salvarsan, two seemed to be uninfluenced by the medication, while he has not encountered a single refractory patient among the last 302 patients given mercurial treatment. Only two of the entire fourteen have been free

from recurring symptoms to date. In several cases there was persisting local infiltration and 0.028 gm. of arsenic was recovered in one case from the necrotic tissue which sloughed off for months after the injection. This patient was entirely incapacitated for business for several months after the injection, as a direct consequence of it. One patient presented symptoms of acute arsenic poisoning after the injection, with edema and erythema of the face, paresthesia in fingers and toes, vomiting, headache and high fever. The edema persisted for sixteen days. Another patient three weeks after the injection developed pains radiating from the focus to the neck, with vertigo. Even in the most favorable cases, Boas affirms, the symptomatic benefit was no more pronounced than is usual under mercury. There was recurrence of symptoms earlier than under the old treatment. He mentions further a fatality recently reported by Morata; a young man, healthy except for a mild recurrence of syphilis two years after infection (papules in the mouth and adenitis universalis), vomited blood three hours after intravenous injection of 0.04 gm. salvarsan; anuria and collapse followed and he died the next day in coma; necropsy showing intense congestion of the epithelium of the kidneys evidently arresting renal functioning completely. Boas' final conclusions are to the effect that salvarsan should be reserved exclusively for the cases in which ordinary treatment has failed."

These are the general dangers of salvarsan, those which I have termed the purely physical dangers; accidents which one may reasonably expect to encounter in entering upon new fields of medication and some of which may be avoided by careful diagnosis and painstaking administration.

There is another and more serious danger, one whose ill effects are more far reaching and disastrous to the many than those comparatively few cases of individual inconvenience and even death, and that is the social danger.

With the first reports of the great discovery by which a single treatment would eradicate syphilis from the human system forever, followed by the newspaper and magazine articles, there was builded up in the breasts of those afflicted ones a pyramid of hope the like of which has not been known in the history of legitimate medicine. This unquestioned acceptance of salvarsan as an absolute specific was and is unwarranted; yet it was drilled into the lay mind by the lay press and by those of the medical profession who sought the ready and easy dollar at the sacrifice of scientific self respect. Accepted by the public as the one and only avenue of escape from the terrors of those late lesions which are the haunting nightmare of the luetic and syphilophobic, there was little apparent effort on the part of the profession at large to disabuse the prospective patient's mind of his

blind and ready belief. The result has been the rearing of a great social danger—a structure which shall fall upon future generations—a danger born of a false sense of security, and it requires little more than ordinary human intelligence to foresee the real danger which must of necessity follow in the wake of an indiscriminate use of salvarsan. One injection in many cases retards the disease and the simple, misguided public, little given to reasoning along any given line of thought, much less in scientific matters, believes itself wholly and permanently cured. There is then removed from the public mind the necessity for care in sexual relations or delay in assuming marital responsibilities. The inevitable result, unless there be an immediate and more serious consideration of the uses and limitations of salvarsan, will be the birth within the next five or ten years of children who will bear the indelible marks of inherited syphilis and there shall be thrust upon us and our responsibilities a brood of immaturities with the physical and mental defects which are the handmaidens of syphilis.

The fact that salvarsan is an arsenic preparation of high activity is being ignored apparently by those who are using it as a routine treatment in syphilitic affections. It is fairly well established now that there is a resistant strain of spirochetes and that these, and probably others, become what is known as "arsenic fast" and that these are not affected by repeated doses of salvarsan. It is here that one of the greatest dangers arises, for the arsenic fast organisms have power to and do bring about those relapses which are reported so frequently. I have no wish to be even inferentially accused of utter hostility to salvarsan; nor do I condemn its use in those selected cases where for cosmetic or other reasons it is indicated; but even then it should be followed by a full and complete course of mercury.

This is in no sense condemnatory; it is rather a serious and calculated note of warning; a plea for less enthusiastic acceptance for free-handed use of a drug which in certain selected cases has distinct merit, but the general use of which in careless manner is to be utterly discouraged. We have not yet witnessed even the faint glimmer of that dawn whose day shall see syphilis swept from the earth as if by magic. Salvarsan is useful. We may say that but no more at the present time. But it is not without danger and its greatest danger lies not with those of to-day, nor those who shall come tomorrow, but with those who are to come after—the innocent, helpless victims of loose-footed affection and the careless professional administration of a publicly over-rated and misused drug for the employment of which there are few indications and whose inconveniences and dangers far outweigh the benefits it confers.

BRONCHO-PNEUMONIA IN CHILDREN.*

By H. A. HOYT, M.D.,

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OWING to the more embryonic condition of the child's lungs, broncho-pneumonia in infants pursues a course in some respects so different from that in adults as to merit separate description, hence the trend of our paper. "Synonyms," lobular pneumonia, catarrhal pneumonia, disseminated pneumonia and capillary bronchitis, by some authorities considered as being identical with broncho-pneumonia, others treat of this as separate condition.

Broncho-pneumonia is an inflammation of the air vesicles and the lung parenchyma, the inflammation occurring in single lobules or in groups of adjacent lobules. The inflamed areas occur in isolated patches in different parts of the lungs. There is always more or less capillary bronchitis, as well as inflammation of the mucous membrane of the larger tubes.

Varieties.—(a) Mild or acute lobular-pneumonia often beginning as a mild bronchitis, with convalescence in eight or ten days.

(b) Secondary lobular-pneumonia with a varying degree of severity following other infections as whooping cough, measles, scarlet fever, etc.

(c) Septic form lasting from three to eight weeks.

(d) Rapidly fatal form of from one to three days' duration.

The predisposing factors are, in the first place, the general ones applicable to all microbial infections or disease, viz: lowered vitality from any and all causes (malnutrition, rachitis, exhausting diarrhoeas, malaria) and any cachexia, and the breathing of impure dust and germ laden air, exposure to cold (but the breathing of pure cold air is not in itself a source of danger). Children who live and sleep in over-heated and ill-ventilated rooms are apt to suffer from all forms of respiratory troubles. In schools, school dormitories and over-heated and carpeted living apartments are daily occurrences, among the rich and poor alike of this infection. Following measles, scarlet fever, diphtheria, influenza, whooping cough and ileocolitis, secondary broncho-pneumonia is most frequently seen in childhood. My experience is most marked with ileocolitis.

Our knowledge of the bacteriology of broncho-pneumonia seems to indicate it is due to more than one germ. The pneumococcus, staphylococcus and streptococcus are principally in evidence, and the streptococcus infection appears to be the most septic and fatal. The pathological changes are seen early. With inflammation of the lobules, there is always accompanying bronchitis. The

mucous membrane of the trachea and bronchi in some cases is normal, in others it is congested. The small bronchi almost invariably show signs of inflammation, the glands are enlarged and softened, irregular patches of consolidated lobules are found scattered throughout the lungs, the air vesicles are found filled with detritus, epithelium and leucocytes, there is edema about consolidated spots, and also scattered areas of collapsed lung and some emphysematous areas. This inflammation is productive, viz.: There is a tendency to the formation of new tissue, especially interstitial and peribronchial tissue. The affected lobules are irregularly scattered in both lungs. They are more abundant in the lower lobes and along the borders of the lobes. Some are deep seated, others are at the pleural surface. In mild cases the diseased area varies from the size of a pea to that of a marble. Between the affected areas, there is a healthy and crepitant lung tissue. With progressive inflammation, many adjacent lobules share in the inflammation and thus large areas of lung substance become involved. In some cases the inflammation may result in suppuration and abscess, producing destruction of lung tissue and formation of cavities. In other cases there is a caseous degeneration and in others gangrenous.

Symptoms.—Broncho-pneumonia has no typical course. The cases differ from each other very markedly. When the case is sudden and primary, it is usually ushered in by a slight chill or a succession of chilly sensations, very often convulsions may replace the chill but are not frequent, late convulsions are ominous. There may be repeated chills, marking an extension of the disease process in new areas of the lung. This symptom is always significant. We observe high fever, cough, rapid and embarrassed respirations, prostration and sometimes cyanosis. The temperature curve is not characteristic as in the lobar variety of pneumonia, but is more of the continuous type though marked by remissions and exacerbations. The daily fluctuations often amount to four or five degrees 101-105. The fever usually continues from one to three weeks and gradually subsides, as very rarely it terminates by crisis. As a rule we expect a high temperature in pneumonia, but this is not invariable. Primary cases may run their course with a temperature not above 101 degrees and even terminate fatally. A low temperature is more often seen in young and delicate infants than in those younger and more robust. Certainly the variability of the temperature, which denotes extension at intervals into new territory, is an important sign of the fever of broncho-pneumonia and is to be taken into consideration in diagnosis and prognosis.

The respirations are always rapid and labored, from 45 to 80 per minute and very often rising to 100, even to 120 in some cases re-

* Read at the Annual Meeting of the Fifth District Branch of the Medical Society of the State of New York, at Utica, October 5, 1911.

ported. On inspiration the soft parts of the chest show marked recessions and the *alæ-nasi* dilate actively. Holt says: The respirations generally seems more embarrassed than the action of the heart, and respiratory failure is a more frequent cause of death than cardiac failure. The pulse is always rapid, from 130 to 200 per minute and usually irregular. The pulse rate is of much less importance than its character. Early it is full and strong, soon it becomes soft, compressible and weak.

For this reason the prostration is usually moderate for a few days but steadily increases as the lung becomes more involved, and before the termination of the disease, have all the symptoms present of a typhoid condition. The nervous symptoms are less frequent than in lobar-pneumonia but delirium may occur at any time during the progress of the disease. In very young children this shows itself by excitement and inability to recognize the nurse or mother. Generally the nervous symptoms depend upon the extent of the disease, the intensity of the infection and upon the susceptibility of the patient.

Pain in the chest is not an annoying symptom but the cough is almost always present and often incessant. There is no expectoration for the mucous is coughed up only to be swallowed again or drawn back into the lung. Sometimes if the patient is turned upon his face or inverted, much of this mucous will be dislodged. This cough prevents rest and often incites vomiting if it occurs after eating. A strong cough is a good indication, a suppression of the cough is always a bad indication for it notes the loss of the reflex sensibility of the bronchial mucous membrane and feeble respiratory muscles.

The digestion is poor and the child takes nourishment with great difficulty. Tympanites and dyspeptic diarrhoea, four to six stools a day of a green color, containing mucous and undigested food, accompanied with vomiting, add much to the danger of the attack and not infrequently turn the scale against the patient, other symptoms being favorable. Distention of the stomach or intestines from gas may cause severe symptoms, owing to the embarrassment of respiration produced by this upward pressure. It is liable to induce cyanosis which usually occurs sometime during the disease. It may occur at the onset and even when slight, is always a danger signal of respiratory failure and needs careful watching and energetic treatment. The skin is moist and perspiring. The urine is scanty and high colored, traces of albumin often present, but a large amount rare.

Physical Signs.—Inspection reveals rapid respirations, livid color of the skin and moist surface. Palpation usually shows a slight increase in vocal fremitus if the area of consolidation is extensive. Otherwise, the results are negative. Percussion reveals a higher pitched note over

consolidated areas. If the consolidated portion is slight there may be hyperresonance. On auscultation, there are present the evidences of bronchitis, also fine subcrepitant rales and sibilant, rough, coarse, musical rales, may be heard over one or both sides. In some cases of the protracted and severe forms, the physical signs are almost nil, and in others approach very nearly to those of the lobar type of pneumonia. Diagnosis presents little difficulty in children as an acute onset, with continuous high fever, rapid respirations and cough, should always lead to suspect broncho-pneumonia.

Prognosis.—Broncho-pneumonia is always a serious disease and in infants, dangerous to life. The mortality among infants being above 50 per cent. The prognosis must always be guarded, for sudden extension of the disease to previously unaffected portions of the lung may, at any time, change the aspect of the case in a few hours. Important factors are previous condition of the patient, and any condition, which diminishes the general vitality, increases the danger from broncho-pneumonia. The height and course of the temperature, the presence or absence of nervous symptoms, the condition of the organs of digestion, the existence of cyanosis and the extent of the disease as shown by physical signs. If food is well taken and retained and the stools show that it is being assimilated, no case is hopeless. But, the existence of vomiting, diarrhoea, or severe indigestion makes the issue doubtful, even though other symptoms are favorable. The suddenness and severity of these symptoms in broncho-pneumonia must be observed to be appreciated.

Treatment.—General measures. Sick room should be well ventilated, maintain a temperature of 65 to 68 degrees, keep the air moist. Nothing is more important for an infant sick with acute pulmonary disease, than plenty of oxygen. Infants should be held in arms part of the time. Older children should be kept in bed. Patient's position should be changed frequently as no child should lie directly on back for hours. High temperature, with dry, hot skin, cerebral restlessness is best met by some form of hydrotherapy as, cool sponging, ice cap to head, or chest or semi-pack. In most cases the bath should be preceded by stimulants. Avoid the use of poultices and many authorities discountenance the use of cotton or oilskin jackets, especially if very high temperature. Counter irritations with mustard, aids respiratory effort. With this disease there is generally great prostration, hence the patient should have a liberal and nutritious diet, and good sustaining treatment is demanded. For heart failure alcohol and strychnine are most dependable. It is a good rule to give only one medicine at a time, and if possible, to get along without drugs, depending upon hygienic measures and careful nursing.

INFANT FEEDING WITH UNDILUTED COW'S MILK.*

By W. B. HANBIDGE, M.D.,

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THE subject of this paper, "Infant Feeding with Undiluted Cow's Milk," has occupied the attention of the writer for a great many years, and was brought about in the following manner:

Some nineteen years ago, twin babies, one weighing three and one-half, the other four and one-half pounds, were brought to the Ogdensburg City Orphanage and placed under the care of one of the Sisters. She fed them undiluted cow's milk slightly sweetened, and when I tried to convince her that the milk should be modified, she assured me that she had fed babies on unmodified milk and they were all fine, healthy children. As the twins were thriving, she certainly had, at that time, the best of the argument. I looked for them to sicken and perhaps die, but, to my surprise, they continued to thrive and became strong, healthy children. Other infants were brought up in the same manner by this Sister until they finally numbered ten.

Ten healthy children fed contrary to our ideas of infant feeding were certainly a great surprise to me, but I did not feel justified in trying the method on my patients when all writers on the subject asserted that whole milk was not a proper food for babies. If I had prescribed such a diet at that time and the infant had died of gastro-intestinal disease, I would not have considered myself blameless, and I felt quite sure that in this the mother would certainly concur.

CASES I, II AND III.—However, when I was called to see an emaciated infant, three months old, on whom a great many foods had been tried, and who at that time was on modified milk, but losing flesh and vomiting frequently, I explained to the mother my observations on whole milk at the Orphanage, and as the case was desperate she was willing to try it. Half an ounce of milk was given every two hours at first, and to our surprise was retained. The quantity was increased and interval lengthened. The child gained in weight and strength from the first and became so vigorous that a few months later it withstood an attack of whooping cough complicated with broncho-pneumonia. The mother of this child assures me that since then she has had two babies whom she brought up from birth on whole milk, and they were healthy children.

CASE IV.—This was the mother's sixth child and she had not been able to nurse any of them. Three of her children had been reared with great difficulty and two had died of gastro-intestinal disease. The mother, after such an experience,

was willing to try anything that promised better results, and when I told her my observations and experience with whole milk, she took the responsibility and put the infant on it. The baby was given half an ounce not oftener than every two hours, and as a rule not until it acted hungry. The quantity was gradually increased as the child became older. I may say this infant never had a sick day, was happy and strong, weighed nineteen pounds when six months old and twenty-five pounds at nine months.

CASE V.—Weight at birth five pounds. Breast fed for eight weeks when it weighed five and one-half pounds. Mother said "It was crying day and night." Was given undiluted cow's milk and immediately improved in every way. In three months it weighed fourteen pounds, a gain of eight and a half pounds in thirteen weeks. At seven months it weighed sixteen pounds and consumed thirty-two ounces of milk in twenty-four hours.

CASE VI.—Mother fed it a proprietary food for two weeks. Child had diarrhœa. She then tried milk one part, water two parts, with cane sugar. Infant had colic and vomited some. When I saw the child it was four weeks old and although the mother did not know its weight at birth, she said it did not look as if it had gained any. An ounce of whole milk, not oftener than every two hours, was prescribed, and gradually the interval was lengthened and quantity increased. Child commenced to thrive and when three months old weighed twelve and one-half pounds. It was well until the fourth month when it had a severe attack of vomiting and diarrhœa which may have been due to over-feeding or milk from new milch cows, as it was in May when many cows in the herd from which the milk was taken were freshening. For two months the mother tried a great many foods, but the diarrhœa persisted and then she consulted me again. I found it at six months weighing twelve pounds, which was one-half pound less than it weighed when three months old. In three weeks the diarrhœa was controlled and whole milk was again tried with the result that the child gained four pounds in a month, weighing sixteen and one-half pounds when eight months old, which is an average weight for a child of that age, although it had lost a pound during the three months it had been ill.

CASE VII.—Was fed a commercial food for a month, had diarrhœa and cried a great deal, then it was given milk one part, water three parts, with a little sugar for a week, diarrhœa continued and baby was very cross. It had not gained in weight in five weeks. The above was the history given by the mother when I was first called to see it. Undiluted cow's milk was prescribed, child became quiet, diarrhœa soon stopped, weight increased to fourteen pounds at end of third month. Mother then commenced to

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feed it about every hour, it did not vomit but had diarrhoea. Interval of feeding lengthened and diarrhoea stopped. Since then it has been a fine healthy child.

CASES VIII AND IX.—These were twins. Modified milk was tried for three weeks but they were colicky and did not gain in weight. Whole milk was used for one week, they gained a quarter of a pound each but were constipated and were cross at times. Mother did not wish to continue the food longer.

CASE X.—Three months' old infant. Nursed one week, commercial food for five weeks. Had diarrhoea and lost flesh. Then milk, water and lime water. Diarrhoea continued off and on. Two and one-half ounces of undiluted milk were given every three hours. Bowels improved in twenty-four hours. Child became quiet and commenced to sleep well. Quantity of food was increased and child continued to do well.

CASE XI.—Weight at birth, nine pounds. Top milk and water equal parts had been given after the first week, then top milk two parts, water one part. Child vomited and had diarrhoea, cried a great deal. Gained only a pound in nine weeks. Barley water was prescribed for two days, then whole milk two ounces every three hours. Child commenced to improve at once in every respect, but the mother lessened the interval and increased the quantity in order to satisfy the child. It gained five pounds in six weeks, weighing fifteen pounds when four months old and consumed twenty-eight ounces of whole milk. Sugar was omitted in this case as it produced diarrhoea. It has since been a healthy child.

CASE XII.—Breast fed, supplemented by whole milk first month. Since then whole milk. Weight at birth, $6\frac{1}{4}$ pounds, at fourth month, fourteen pounds. It has continued to grow and is now a vigorous child.

CASE XIII.—Whole milk from birth. Did not seem to thrive as well as it should. Was put on modified milk. Have not been able to follow up this case.

CASE XIV.—A trained nurse cared for it for six weeks. It was fed on top milk one part, water three parts and sugar of milk. Was very colicky, crying a great deal. Gained one and one-half pounds in six weeks. Seventh week water was reduced so that dilution was one part top milk and one of water. Gained in weight nine ounces and cried less. Eighth week on top milk without any dilution, gained one pound and continued to thrive and is now a healthy child.

CASE XV.—Breast fed first month, supplemented by whole milk, then whole milk. Weight at birth seven and one-half pounds, at sixth month, twenty pounds, and consumed forty-five ounces of whole milk in twenty-four hours. Is still thriving.

CASE XVI.—Modified milk for two weeks.

Child colicky and not doing well. Undiluted milk one week, gain one-half pound. Child was still cross and the mother stopped the food.

In order not unduly to prolong this paper with individual reports, I will say that seven other infants that had not been doing well were fed whole milk and in every case the results were entirely satisfactory.

All these children that have been fed on whole milk are alive at the present time except one that died when a few years old, after it left the Orphanage. Their ages are, at the present time, from three and one-half months to eighteen years.

In only four cases out of the thirty-three put on this food, was a change made. They were on it only a short time and in three there was no reason for not continuing, except that the mothers were afraid to try it longer. The infants fed in this manner were strong, healthy children, and cried much less than the average bottle fed babies.

It is an instinct for a mother to feed a child when it cries, and theoretically, at least a healthy child should not cry unless it is hungry. One thing I tried to impress upon them was the necessity of not feeding them oftener than every two or three hours, and if the child went longer without acting hungry all right. I am satisfied that most of them after two hours elapsed were fed all they would take and allowed to sleep as long as they wished before being fed again.

I called to see these children occasionally as I was afraid they would go wrong, and sometimes I was startled at the amount of milk the mother was giving them at a feeding. When I would remonstrate she would probably say, "He is hungry and must have it. He is well and goes to sleep for three or four hours after being fed."

I believe it is nature's way to feed only when hungry. What is it that suggests the frequency of feeding in the lower mammals? It is no doubt the craving of hunger. If the digestion is good and appetite keen they look for it often, if not good less frequently.

In the human family, from the time that Eve nursed her first born, until recent times, I have no doubt that infants were fed when they cried. If they were healthy children and cried from hunger all was well. If they were ill they were injured, but this was one of nature's ways of eliminating the unfit, and improving the race. In recent years science has appeared upon the scene with a time-piece, and while preventing the sick from being fed too often, probably insists on feeding children that are not hungry.

Dr. Elkins has been kind enough to allow me to incorporate in this report three cases fed on whole milk.

CASE I.—Baby, six months old. Had been fed modified milk; also several prepared foods, but none of them agreed with it, child was cross

and did not gain in weight. Whole milk was tried as a last resort. It ceased vomiting, began to grow, was good natured and since then has continued to thrive, and at present is on clear milk at the age of ten months.

The doctor reports that the other two children gave practically the same history except that the time of beginning whole milk feeding was, in one case, at the third month, in the other at the fifth.

Dr. Mason also writes me that he has tried this method of feeding in three cases. In the first very reluctantly, as he candidly told me he was not impressed by my paper on this subject at our county meeting a year ago.

CASE I.—Mother nursed him two weeks. He did well. Then various foods were tried but he did not gain. At birth he weighed eight and one-half pounds and at three months only ten and one-half. He was fretful and vomited habitually. He was given two and one-half ounces of undiluted cow's milk, which was the first feeding he had entirely retained since being fed artificially. Began to thrive and in five weeks gained three pounds and has continued to do well. Is now ten months old, is sturdy and well and weighs nineteen pounds. During the last two months he has taken an ounce of oatmeal gruel in seven ounces of milk as bowels were a little constipated.

The doctor has not given me particulars regarding the other two cases, but says "In all fairness to the whole milk feeding, I want to say that I tried all other methods first, but must admit that the three cases I have had on whole milk have been very satisfactory." In one case Dr. Mason added a little more fat bringing the percentage up to four and one-half. I think this a good idea if there is constipation. I am satisfied, however, that there is plenty of fat in pure whole milk to properly nourish an infant.

Thirty-five successful cases fed contrary to our accepted method have certainly made a great impression on me. Only four children upon whom it was tried stopped using whole milk.

I have asked myself a great many questions but I have not been able to answer them all to my own satisfaction. I feel justified, however, in concluding that the statement that infants cannot digest milk that is not modified is not true. Is it possible that we have made a goddess of chemistry, and in worshiping at her shrine have forgotten other teachings? We have been trying to get a food that chemically resembles mother's milk, but chemistry is a poor criterion to go by in arriving at the digestibility of any food. Chemistry certainly led us astray in our diagnosis of diseases of the stomach. We have analyzed the gastric juice and have given various names to the altered secretion, when the real cause was chronic appendicitis, duodenal ulcer, gall stones, or perhaps some obstruction at the pylorus. The stomach does not seem to occupy the posi-

tion in the digestive process that was assigned to it many years ago. Surgeons remove large portions of it, and if there is a free opening between stomach and intestines the digestion may be good. If, however, there is undue retention of food in the stomach we at once have gastric disturbance. If there be vigorous peristalsis and free outlet the food is quickly liquified and passed into the bowels. Under the above conditions firm curds will not form in the stomach. An atonic and dilated stomach is conducive to retention of food and firm curds.

Now what have we been doing when feeding infants large quantities of liquid? One of the most popular text books written for the instruction of mothers gives the quantity of modified milk for a ten-pound child, eight weeks old, as thirty-two ounces in twenty-four hours. If a child weighing ten pounds be fed thirty-two ounces in twenty-four hours, how much liquid would an adult weighing one hundred and fifty pounds take in order to consume a proportionate amount of liquid according to weight? The answer is four hundred and eighty ounces, or thirty ounces every hour one is awake, allowing eight hours for sleep.

We have not been content with that much liquid, but we have been advising mothers to give them water between feedings. We must admit, however, that infants can consume more liquid in proportion to weight than adults. The muscles of the infant's stomach at birth are poorly developed, and in giving such a large quantity of liquid are we not producing dilatation and atony of that organ and consequently interfering with the proper emptying of the stomach which is essential to good digestion. Are we not diluting the gastric secretion so that the digestive process will be slow? Are we not taxing to their fullest capacity every cell of absorption and excretion? May not the bowels also be distended and the muscles weakened, hence colic?

My observations teach me that from one and three-quarters to two and one-quarter ounces of undiluted cow's milk per pound weight in twenty-four hours is sufficient to nourish a child. If that be so an infant on whole milk would only take about two-thirds as much liquid as one on modified milk.

A plentiful supply of nitrogen is essential for vigorous cell growth and when whole milk is given I have noticed a strong muscular development of the trunk and extremities. If the muscles of the stomach and bowels partake in this development, there should be strong, regular peristalsis without gaseous distension and cramps, and when we think of the lax convoluted sigmoid of the infant we can understand why we should have colic unless vigorous peristalsis be present.

One cannot consider the above cases without

arriving at conclusions, some positive, others provisional.

I feel certain that this diet was an excellent food for these thirty-five babies, and I think there is no reasonable doubt that some of their lives were saved by it. If undiluted milk be good for babies with weak digestion, might it not be good for those that are well? If an infant is doing well on modified milk I would leave it alone, if not I would certainly, without hesitation, try whole milk. I can now do this with the assurance that I am not suffering from an obsession, since some of my confreres in St. Lawrence County have had good results, and also since I have learned that a few European writers for some years have been advocating whole milk. What I feared at first, overfeeding unless the quantity is carefully regulated, is not apt to occur if the child be fed only when hungry. The concentrated food seems to satisfy the child before too much has been taken.

I believe in starting with a small quantity and increasing a little at each feeding until the proper amount is arrived at. In young children who have been on modified milk, I would gradually decrease the amount of water, occasionally I might add a little lime water. If whole milk is agreeing but child constipated I would add more sugar or use top milk.

BULLET WOUNDS OF THE ABDOMEN —REPORT OF A CASE OF BULLET WOUND OF THE SIGMOID AND BLADDER, DURING AN ACUTE EX- ACERBATION OF A CHRONIC APPEN- DICITIS — EARLY LAPAROTOMY — RECOVERY.*

By CHRISTIAN G. HACKER, M.D.

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THE successful treatment of injuries of the abdominal viscera is always of interest. Nonpenetrating abdominal wounds without infection have little seriousness. Before the era of antisepsis such injuries in war had a mortality of 7%. During the Spanish-American campaign over 60 wounds of this character occurred with no mortality. The gravity of penetrating wounds of the abdomen depends largely upon whether or not there is visceral perforation.

The character of the wounds inflicted is dependent upon many factors. Those received in civil life are usually caused by the old lead bullet which produces wounds which are usually large and ragged; more crooked, and, therefore, more liable to infection than those produced by the steel jacket bullet. This has an important bearing on the relative mortality.

It can be readily explained why the reported

cases during recent warfare as recovering with non-operative treatment occurred, for many of the cases were possibly penetration wounds without visceral injury. In the literature many such cases are reported, among which are those of Stimson, two by Senn out of 16, in which the hydrogen gas test demonstrated no perforation and recovery followed without operation. He also reported four instances out of sixteen without visceral lesion in experiments on the cadaver. These wounds were all at or above the umbilicus. In these experiments all the wounds below this level caused intestinal perforations. These instances might be multiplied, but show that penetration is not always followed by perforation of viscera. The reported recoveries without operative measures may also be accounted for in the following manner: in that a steel jacket bullet may pass through several coils of intestine producing a very small puncture around which fibrin is very rapidly thrown; and, if peristalsis is not disturbed by the administration of food, drink or cathartics, rapid healing takes place. The soldier is (as a rule an athlete in otherwise healthy condition) injured while suffering from hunger with his intestinal tract fairly empty, and, therefore, with relatively less that might be forced into the peritoneal cavity.

A very common statement found in text books is that extravasation takes place immediately upon the receipt of the wound. The experimental work of Shachner and Parkes and others does not bear this out nor does clinical study. When does extravasation take place? The belief of Murphy and Shachner is that it does not occur until the intestines are handled. This was true in our case. Without handling extravasation frequently does not occur until the gut is distended, causing an obliteration of the ectropion valve of mucous membrane opening the wound which is generally after twenty-four hours.

The chief factors in the prevention of extravasation are the ectropion of the mucous membrane and the valve-like character of the wound with the arrested peristalsis which is a direct effect of a gunshot wound and is clinically recognized by arrest of bowel action. If peristalsis is resumed the mucous membrane is drawn in with obliteration of the ectropion and extravasation occurs.

It would appear that these physiological efforts of nature would suggest the treatment and that whether or not surgical operation is performed we must respect nature's effort to produce peristaltic rest. Allowing that recovery may follow in certain cases with nonoperative interference, no perforation, however small, can be depended upon to prevent the escape of infectious contents and gases; even from the smallest perforation a fatal peritonitis may result. For a time extravasation may be limited by inflammatory adhesions, but the supply of infectious matter is generally too great to be localized. The

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most common cause of multiple perforations is the oblique wound from side to side. These again are most frequent in the ileum and are also the most serious. Generally speaking, wounds of the solid viscera are not as fatal as those of the alimentary canal while those involving both thoracic and abdominal viscera are usually fatal. The examination of the patient and the wound is best limited to inspection. Digital examination is often impossible, very uncertain, and may open a rent which nature has closed, forcing intestinal contents into the peritoneal cavity; at least diagnostic abdominal massage promotes infection.

The use of the probe for diagnostic purposes is to be limited to use only under the most rigid asepsis; its value, however, is extremely uncertain, for it may be slipped between the fascial planes and a mistaken idea conveyed to the examiner leading to the erroneous conclusion of nonpenetration. On the other hand if it enters the abdomen a laparotomy must be performed.

The indications for early operation may well be stated in the words written by M. H. Richardson, *A.M.A.*, LVI. No. 10,725: namely, "that in abdominal trauma whatever the cause we must not wait until there is muscular rigidity, vomiting and distention. We all know that when these symptoms are present operations succeed only by a miracle." If the pupils are not dilated although pulseless operation is indicated.

Contraindications to Operation in cases seen early are shock bordering on collapse. These patients may become better operative risks after the use of direct blood transfusion, saline infusion and stimulants. The surroundings may be such as to preclude the possibility of a successful abdominal section. In cases seen late, *i. e.*, 18 to 24 hours, that are doing well or with a peritonitis, operation is contraindicated and the inhibition of peristalsis is of great importance.

The Mortality of bullet wounds of the viscera depends chiefly upon the location of the perforations. Except in cases in which severe hæmorrhage occurs, death is usually due to peritonitis, which may result from material carried about the bullet, but more frequently it is the result of material escaping from the injured viscera. Perforations of the stomach and duodenum operated on within six hours have a surprisingly low mortality compared with those of the ileum and large intestine. This may be explained by the relatively low number of bacteria in the contents of the parts involved. The gastric juice in normal persons not only acts upon the food but also upon the bacteria which accompany it so that upon entering the duodenum it is practically sterile. Here it meets the bile which inhibits bacterial growth until the food reaches the ileum. It is for this reason that peritonitis following perforations of the upper gastro-intestinal tract is slower in its onset.

Seigle's table of 1898 contains a report of 532 wounds of the abdomen treated without operation, shows a mortality of 55.2%, and in 736 cases operated a mortality of 51.6%. These shown results taken without question speak strongly in favor of immediate operative intervention. This table considered as to time of operation shows positively that the longer there is delay in operating the greater the mortality, and speaks loud for early operation for it shows a mortality of only 15.20% in cases operated under four hours. After 12 hours the mortality was 70%. In a series of 65 cases collected by Douglas, *Surgical Diseases of the Abdomen*, p. 604, operated 32.2% died. He does not attribute the great difference in mortality to the difference in skill of the operators for the cases were indiscriminately chosen, but rather ascribes it to the recognition by the profession at large that the element of time elapse between accident and operation most surely affects the result. Improvements in technique have contributed to the good results as has also direct blood transfusion and the infusion of saline solution.

Symptoms.—There are no positive signs of perforation, but as 95% of the cases of penetrating wounds are perforative requiring repair, and considering the low mortality of exploratory laparotomy there is no sane reason for delaying surgical interference. The peritoneum in these cases is unprepared for the sudden bacterial invasion and, therefore, the perforation should be closed as soon as possible. Symptoms depend largely also on the amount of material in the viscera, the size of the opening, the type of the injury and the location of the perforations.

The symptoms of the first few hours are the important ones. Waiting for symptoms frequently kills the patient because they are due to peritonitis. Visceral symptoms may be delayed for hours. Shock in its intensity increases with hæmorrhage. Its absence is no indication of absence of visceral injury. Pulse and temperature are influenced by anemia and peritonitis.

Irritability of the bladder is common and a moderately early symptom of peritoneal irritation. Obliteration of peristalsis is one of the most important signs of perforation of the intestine or stomach. It is a most constant symptom and rarely absent.

Treatment.—Without the privilege to explore, the early use of anodynes is to be most emphatically condemned. They only serve to disguise and obscure the true clinical picture. After you have the patient's consent to explore then anodynes to inhibit peristalsis and to relieve pain. The lack of initiative is particularly serious in these cases. In homicide cases we have the life of the victim and the assailant in the balance. Quoting from Andrew's *S. G. & O.*, XII, 63, who in the following words states the situation perfectly: "In rupture of the intestines from blows the earliest

possible exploration should be made equally for diagnosis and for treatment. It should be remembered that we do no harm if we open the belly and find it normal, but the opposite mistake omitting the exploration may cause a death." Therefore, in cases under 12 hours in proper surroundings with aseptic technique and facilities at hand, the rational treatment would seem in abdominal bullet wound cases which may have or not penetrated the peritoneal cavity to suspect that every penetrating wound is a perforating wound and to never be content until we are within the abdomen. In other words, early exploration through a median incision, the control of bleeding, the repair of rents inflicted to forestall peritonitis, the establishment of drainage through the tract of the wound or a stab wound and the application of those measures which tend to produce absolute peristaltic rest; namely, the prophylactic treatment of peritoneal infections as advocated by Ochsner. These must be most thoroughly understood. Frequently I hear the statement made by men who deprecate this treatment,—I used a modified Ochsner treatment. An analysis of their modification soon elicits the fact plainly that by modifying it they produced peristalsis. Often it is only an occasional dram of water or perhaps a mild laxative.

This treatment means absolutely nothing by mouth, the use of opiates without atropine for pain and to lessen peristalsis. Sustain the patient by the use of drop salt solution per rectum; however, if the lesion is in the rectum or sigmoid, it must be employed subcutaneously instead. The thirst in these cases is partially alleviated by the saline solution, also by rinsing the mouth frequently with some unpalatable but not nauseating aqueous solution which will insure that it is not swallowed by the patient, thereby producing serious peristalsis. A valuable adjunct in relieving thirst is the chewing of gum which also prevents parotiditis.

PATIENT REFERRED BY DR. FRED. L. CLASSEN,
ALBANY, N. Y.

Case History.—Surgical No. 1149. A married man, aged 46 years.

Past History is that during the last year he has held slight pain in his lower right abdominal quadrant and was suffering from an attack of this same kind of pain on the morning of and at the time he was shot. These attacks usually lasted about 30 minutes and had no relation to his taking food. He has had a bronchitis for a month. He smokes moderately and uses alcoholics. Bowels usually constipated, except when using alcoholics.

Present Illness is that between 1:30 and 1:45 P. M. on June 9th, 1911, after eating a hearty dinner, he was shot through the left leg and through the left side of his abdomen. I saw him 20 minutes after the shooting. He was

conscious and in bed partly dressed. He talked freely, complaining of an intense desire to urinate and to defecate. He had not vomited; color fair, pupils equal and reacted to light. Pulse 84 per minute; tension moderate. The abdomen was not palpated. From the direction of the wound tract and the vesical and rectal tenesmus, I decided that the bullet had entered the peritoneal cavity and probably penetrated the bladder. The need of urgent operative measures was explained to the patient and he agreed to abide by my judgment. Then $\frac{1}{4}$ gr. morphine sulph. without atropine was given hypodermically and preparations made for exploration. He was accordingly admitted to the Albany Hospital. Catheterization revealed a bloody urine. Under ether anaesthesia a median incision was made extending from the umbilicus to the pubes.

Pathology.—At a point 7 cm. above the middle Poupart's ligament on the left side, passing obliquely downward and inward toward the right is a penetrating wound about .5 cm. in diameter about which the skin is ragged and injected. There is no discharge from the wound. The abdomen is flat. No retraction is apparent. Upon opening the abdomen the small intestines were collapsed but soon became distended after handling. This gave an excellent opportunity for a thorough and rapid examination for perforation. No perforation was found in this portion of the intestine. It was then displaced to the right and an examination of the large intestine made beginning at the ileocaecal valve; in the sigmoid at a point where it enters the true pelvis, an oblique rent was found $2\frac{1}{2}$ cm. long. The edges of this rent were ragged and everted, the protruding mucus membrane acting as a protective valve. In an appendix epiploica attached to the transverse colon was a large haematoma. Below and to the right in the upper left quadrant of the fundus of the bladder was a perforation 1 cm. in diameter. A slight amount of blood was present in the pelvis but no faecal matter. The appendix was markedly swollen and acutely inflamed. It measured 9 cm. in length and had a mesentery. Its peritoneum was congested. The proximal 2-3 measures approximately 1.2 cm. in diameter, whereas the distal 1-3 is bulbous, measuring 1.8 cm. through its greatest diameter.

At the inner side of the left leg about 18 cm. above the inner maleolus is a perforation 1 cm. in diameter about which there is slight discoloration and the edges of which were inverted, a similar wound is present about 5 cm. above the same maleolus directly in the middle of the posterior aspect of the leg over the tendo achilles. This wound has everted edges. There was no visible haemorrhage about either wound. Not only was there perforation of the large intestine and bladder, but an acute exacerbation of a chronic appendicitis. To remove the appendix

would have increased the danger of the operation and also endangered the life of the assailant as well as the victim in this case. We, therefore, did not remove the appendix because the post-operative treatment for perforation and the non-operative treatment for acute appendicitis were similar and could be applied here to advantage. The perforation in the sigmoid was encircled with a purse string suture of silk and in turn covered with a continuous lemborth suture of the same material. Placing the patient in the Trendelenberg position the bladder wound was closed in layers. The direction of the bladder wound was obliquely downward from the left to the right and posteriorly across the bladder. Believing that the bullet had passed through the bladder wall again and through the sacrosiatic foramen lodging in the gluteal muscles, no further search for it was made. After two cigarette drains had been passed through the bullet wound tract, down to the perforations, the abdominal incision was closed in layers. To remove as much blood and clots from the bladder as possible it was irrigated with warm boracic acid solution through an ordinary soft catheter, taking care not to cause complete distention of that viscus. The catheter was permitted to remain in the bladder for the purpose of establishing continuous drainage and was retained in position by sewing it to the prepuce with silk sutures. The patient left the table with a pulse of 120 and at 4:30 P. M. he was in fair-

ly good condition and at this time was given an immunizing dose of tetanus antitoxine. He was placed in the Fowler position and tilted to the left side to facilitate drainage of the peritoneal cavity through the bullet wound tract, and, to keep the infection in that part of the peritoneal cavity from which absorption is the least. This position also prevented extravasation of urine into the cellular tissue through the opening in the right side of the bladder. Morphine without atropine was given hypodermically for the pain as necessary. Considering the wound in the sigmoid, it was regarded as unsafe to use the rectum for saline administration; therefore, it was given subcutaneously instead. In the first twelve hours postoperative 3,500 c.c. was given; in the next twelve hours 850 c.c. On the 11th of June or the second day after the operation a broncho pneumonia complicated convalescence; at this time, with no nausea or distension, hot water in drachm doses was hourly given and retained. Gradually the urine became blood free and on the eighth day the retaining catheter was removed. The following three days catheterization was employed at intervals of six to eight hours. The eleventh day he voided 10 ounces of urine at one time. The twelfth day, *i. e.*, for the first time since operation, an effort was made to empty the rectum with a soapsuds enema. A tarry stool was the result. The wounds in the leg which had been kept in a continuous 12% alcohol and boracic pack had healed per primum. On the



Showing bullet entrance wound.



1. Shadow represents beginning bedsore.
2. Exit of bullet.

18th day the patient complained of pain in his right buttock, which on examination revealed a nodular mass. The following day an incision was made into it without anæsthesia and deeply situated in the superficial fascia surrounded by an area of induration which also contained a small amount of necrotic material, a .38 caliber bullet was found and removed. The patient made a perfect recovery, leaving the hospital on the twenty-second day after the accident without bladder or rectal disturbance.

The important points concerning this case are the following:

First—That it was a case of penetrating wound of the abdomen with sigmoid and bladder perforation, received during an acute exacerbation of a chronic appendicitis.

Second—That at the time of the injury the stomach contained a full meal.

Third—That laparotomy was completed within three hours after the injury. This had a most important bearing upon the end result.

Fourth—That it demonstrated the value of the production of peristaltic rest in the prophylactic treatment of peritoneal infections and in the control of acute appendicitis.

A CASE OF ERYTHEMA MULTIFORME AND TYPHOID, PRESENTING UNUSUAL SYMPTOMS.

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WE report the following case in which two diseases, each of which ordinarily run from four to eight weeks, occurred in a previously healthy man, and ran a course of twenty weeks, and which presented a number of unusual features, and after a long illness and convalescence, which promised to end by patient getting well, suddenly terminated fatally.

W. V., male, aged 43 years, farmer, presents a model personal and family history. He had never been seriously sick before present illness. Total abstainer from alcohol and tobacco. No history of tuberculosis or syphilis. He is a rugged man, six feet tall, leading a healthy out-door life. His father died of angina pectoris, at an advanced age. His mother is living and well. His illness began about August 1, 1911. His family first noticed a macular eruption on his face and hands, and as it did not annoy him he paid no attention to it. A few days after this he noticed an eruption on anterior aspect of thighs. He also noticed that his mouth was sore when he ate, and that he had a nasal catarrh. He complained of being tired. About August 16th, being in town, he saw a physician. A tonic and mouth wash was prescribed. His condition grew worse, but he continued to work.

August 23d we saw him for the first time. His condition was as follows: Patient sitting in arm chair, and said he felt so tired he could hardly

drag around. Face: macular eruption on cheeks, forehead and bridge of nose. Macules varied in size from pea to ten-cent piece. Color: light red at this time. Shape: round, irregularly round and irregular. Macules were not raised above surrounding skin. Eyes: lids were somewhat swollen, and conjunctivæ, both ocular and palpebral, were injected, giving appearance not unlike observed in measles. Mouth: tongue dry, no sordes at this time. Aphthous ulcers presented themselves on inner aspect of cheeks, on hard palate and on gums. Ulcers varied in size from pinhead to split pea. They were sensitive to touch, and taking food occasioned pain. No offensive odor to breath. A troublesome catarrh of nasopharynx occasioned constant hawking and spitting of large quantities of clear mucus. There was no discharge from nose. Eruption on body. On extensor surfaces of fingers, hands and forearms, and to a lesser extent on anterior surfaces of thighs, and over shins, a multiform eruption showed itself as follows: Macules: light red in color, varying in size from pin head to pea. Papules: varying in size from birdshot up to buckshot. Color: same as macules. Tubercles: hard, red and violet. Size: kernel of corn in circumference, and elevated one-eighth to one-quarter of an inch above surrounding skin. The rest of the body, flexor surfaces, abdomen, chest, back, neck and upper arms were free. The eruption gave the patient no discomfort. At this time or subsequently did the eruption pain, burn or itch. Pustules at no time formed. There were some crusts scattered over scalp. The pulse was 84, full, regular and strong. It had a feverish bound. Temperature at 2 P. M. was 99.6. Respiration, 18. Heart and lungs were normal. Bowels, open and normal. Urine, normal in quantity and clear. Spleen, not enlarged.

Patient ordered to bed and a liquid, easily digested diet ordered. An evacuant dose of calomel was given. A diagnosis of erythema multiforme was made. Remembering that Hyde and Montgomery say that erythema multiforme often precedes typhoid, the latter was thought of. The following day we made a modified Widal, which was negative. Specific gravity, 1022. No albumen or sugar. During the next week the patient was very restless at night, and suffered from severe sweats. Bromides controlled the former, and as the author believes that sweating like fever is a conservative process, and does good by eliminating toxins, nothing was done to check it, save an occasional dose of atropine to give the patient comfort. Quinine sulph. gr. 5 was given four times a day on general principles.

August 26th Russo's test (adding four drops of aqueous solution of methylene blue 1/1000 to one ounce of urine). If typhoid is present, a decidedly green color results. This test is not pathognomonic of typhoid, reacting in a number of other conditions, but as it reacts before the Widal test does, its presence early in a fever is suggestive.

We made a blood examination. Thoma-Zeiss apparatus used. Leucocytes, 9,000; reds, normal.

August 28th roseola appeared on the abdomen. August 29th a second modified Widal was made which was positive. So a diagnosis of typhoid was also made. The spleen was now palpable, which could be felt slightly enlarged for two weeks. There were three or four successive crops of roseola during the next four weeks.

The announcement of typhoid fever alarmed the family, and Dr. Calvin Emerick of Glasco was called in consultation who confirmed the diagnosis.

August 30th morning temperature, $99\frac{1}{2}$; evening, $100\frac{1}{2}$. Patient fairly comfortable and only mildly sick. The naso-pharyngeal catarrh was the most troublesome symptom, the patient discharging large quantities of clear mucus which was hawked from naso-pharynx. Some days it was estimated a pint was thus discharged. This mucus discharge persisted for a month, in spite of local treatment. Douching and spraying with Seiler's and Dobell's solution, adrenalin and dilute peroxide of hydrogen.

The patient went on about one month, not very sick. The temperature in evening reaching $102\frac{1}{2}$ and morning about 100. These temperature changes took place with almost clock-like regularity. Some nights patient rested good, other nights restless on account of the catarrhal discharge. This discharge was not offensive, but later as other complications arose there was an offensive odor.

The stomach function was good, the patient taking an ample supply of nourishment, which occasioned no symptoms of indigestion. There was no nausea or vomiting during the entire sickness. Milk, buttermilk, eggs, meat juice and soups constituted the diet. During the first month the eruption became more aggravated. The macules on the face coalesced until they became the size of a silver dollar. They were now of a purple and angry hue. The eruption on the hands and forearms became more intense. Macules larger, and purple in color. There was an erythematous blush on hands and forearms, over which there was about one hundred papules and tubercles scattered. The eruption extended to the buttocks and posterior surfaces of thighs, being papular in this situation. About September 23d the tubercles and papules on dorsum of fingers began to decline and get smaller, and the macules became lighter in morning, but in evening when temperature was up they became darker.

As the eruption on fingers and hands began to improve, a hæmorrhagic purpura appeared on both arms simultaneously. Beginning at about insertion of deltoid it followed in a serpiginous course down external aspect of upper arm to two or three inches below elbow. The hæmorrhages were irregular in outline, being on average two inches wide and about eight inches long. They

did not pain or itch. They continued to get darker for two weeks, at which time they were nearly black, and elevated one-eighth inch above surrounding skin. They finally degenerated into dark hæmorrhagic crusts, which in two weeks more fell off, leaving well-defined depressed pigmented scars. At first these scars were pigmented purple, which gradually became lighter, but always remained sharply defined, pigmented cicatrices.

Throughout the disease no pustules or wheals formed. Owing to the liquid diet the bowels became constipated. Olive oil was given t. i. d., also prune juice. No drugs were given up to the eighth week to move the bowels; they were moved every day by enema of warm water to which a few drops of oil of turpentine were added. The urine on repeated tests contained no albumen or mucus. The green reaction for Russo's test became lighter, and finally disappeared. The quinine was given for about a week in the beginning of the fever, and was replaced by salol gr. 5 every four hours and bismuth beta-naphthol four times a day. Fowler's solution in increasing doses was given with view to influence the skin lesion. The patient's pulse up to September 25th kept from 90 to 100. Without apparent cause it suddenly jumped to 120, and as Russo's test reacted very positively again, an extension of the typhoid to some other organ was suggested.

The patient so far has not been delirious, and was taking food well and had not lost flesh much, considering that he had been sick seven weeks and running a temperature up to $103\frac{1}{2}$. His heart was normal, no valvular leaks, no hypertrophy, and no myocarditis. There were no rales anywhere over the lungs. The respirations were 18 to 20 throughout the sickness, never going above the latter figure. There was no hæmorrhage from bowels, and stools were good color.

About September 26th, after bowels moved, a large hæmorrhoid was noticed, about size of black walnut. This complication gave the patient pain, and sedative lotions were applied. In a day or two it was apparent an abscess was forming, and in three days after it first appeared it ruptured, and discharged an offensive pus. It was kept clean with peroxide.

At this time I asked my friend, Dr. Chas. T. Montgomery, of Saugerties, to see the case with me. He agreed with me in diagnosis and treatment, but advised milk as a diet be withdrawn. He had been taking a good quantity of milk and buttermilk daily; in fact, this is the only food he cared for. His nasal discharge had almost stopped, and his skin lesions were much better, but his pulse was 120 to 125 and he was getting very weak. On this day a peculiar whitish eruption presented itself on the uvula and posterior part of hard palate. It looked as if a multitude of vesicles had coalesced and broken down, become water-logged and white.

The patch was about three inches long and one inch wide. In a day or two it could not be clinically distinguished from a diphtheritic membrane. A culture by State Board of Health was negative. Peroxide, tincture ferri chlor., and other applications were made. In a few days this membrane was exfoliated, which left an eroded depressed surface. This membrane subsequently returned four or five times. The nasal mucosa was also evidently involved, as there was more or less obstruction to breathing, and the voice was nasal. He discharged pieces of membrane from nose. There was no offensive odor. A second culture a week later was also negative.

To return to the hæmorrhoid. In three days it had abscessed; in a few days more it gangrened, which spread rapidly. Under cocaine the gangrenous area was trimmed off, and the abscess cavity curetted. It was dressed with wet bichloride changed every few hours.

This gangrene resulted in a horseshoe shaped cavity surrounding the anus. It was about two inches deep, and involved the anterior rectal wall. It involved the perineum, and came dangerously near the deep urethra. Creolin in a two per cent. solution changed every few hours, worked like magic giving the ulcerated area a good clean pink color in a few days. The gangrenous patches disappeared and also the odor. As was to be expected, so violent an inflammation in region of bladder and urethra caused urinary troubles.

My next visit found retension of urine. The catheter easily entered and drew off one quart of bloody urine. This we centrifuged, and found both red and white corpuscles in large quantities. A specimen was stained and large numbers of cocci were present. Each pus corpuscle contained from four to six cocci. There were no bacteria of the typhoid or colon group. Patient had to be catheterized every four hours, which was followed by washing bladder with half per cent. of creolin solution while the catheter was in situ. The pus and blood in a few days cleared up. Urotropin gr. 10 every four hours was given at the beginning of these urinary symptoms. It was found harder and harder to get into the bladder, as if there was some obstruction in the deep urethra. The patient had no previous prostate trouble, saying that he never had a bit of trouble to make water in his life. The urine became very ammoniacal, there was constant desire to void, and constant dribbling. The patient was delirious, and so weak he could not turn or move in bed. Voice very weak.

At this time twitching of hands were noticed, and during sleep patient would jerk and twitch constantly. There was also a marked tremor of hands and lower jaw, and patient looked as if he was on the verge of uræmic convulsions. The urine contained large quantities of albumen. It was at first thought that the albumen

was part of the cystitis, but as the twitching and delirium was so bad we examined the centrifuged urine microscopically, and discovered granular casts. So a diagnosis of acute nephritis was made. The patient was given two, three or four hot packs a day. Good genuine hot packs, from which the patient perspired two hours followed by a sleep. Stimulation by whiskey, strychnine and digitalis was pushed. Proteid diet reduced to a minimum. Salol and beta-naphthol had long since been withdrawn. The patient would have pain on urination, passing long strings of mucus, which occasioned great pain. The patient now presented a desperate picture. Emaciated to a skeleton, too weak to move, delirious three weeks, ammoniacal urine, small abscesses recurring around original abscess around rectum, bedsores almost ready to break through, small boils on different parts of body, the urine loaded with a bacillus of the typhoid or colon group, the temperature running a crazy course for six weeks, 103 to 96, sometimes see-sawing back and forth within these limits three and four times a day. With these symptoms it was evident the patient was desperately ill with a uræmic and septic poisoning.

The patient had received, since these severe symptoms supervened 50,000,000 dead typhoid, and 100,000,000 each of dead streptococcus and staphylococcus every four or five days. I think these vaccine injections did good. At this time Dr. Rufus Crawford, of Saugerties, saw the case with me, and advised that stimulation be pushed. Whether the vaccines were responsible in helping the patient to get up I do not know, anyhow he commenced to void spontaneously, and urine became more normal in color and odor, the twitchings and jerkings stopped; the temperature became more regular, 101 to 98; the mind cleared up; albumen casts and pus less, but the nose commenced to give off a fetid odor, and large scabs or sloughs three inches long and one inch wide and one-eighth inch thick were drawn out of left nostril every few days. It was seen the septum had been perforated. The cervical and maxillary glands were not enlarged, or had they been at any time. Deafness ensued, followed by suppurating otitis media on both sides. Ears were irrigated by boric acid solution. Nose was douched by different antiseptics. Carbolic acid in two per cent. strength seemed to act the best.

November 20th the patient had improved. Membrane in throat entirely disappeared, hearing greatly improved, albumen disappeared from urine, pulse had dropped to 100, patient hungry, and sits propped up in bed half hour once a day. The eruption on hands and arms had disappeared, the macules had disappeared, but where the papules and tubercles were there were macules, of pigmented spots. Where

there had been the hæmorrhagic peripura, there was an irregular purple pigmented scar six inches long. The ulcer in the perineum is about size of fifty cent piece, and shallow.

November 24th patient can turn freely in bed. Voice strong. Taking on flesh. Diet: Milk, buttermilk, broths, soups, roast meats, baked potato, baked apple, prunes, vegetables, save beans and cabbage.

December 1st complains of discomfort after urination, and passes strings of mucus. Urotropine for a few days entirely stopped this.

December 8th patient much improved, sits up four hours a day. Hungry. Sleeps well. Bowels move good every day naturally. Temperature has been normal for two weeks. Saw patient at 10 A. M. He was sitting up, feeling good, was cheerful, and he evidently thought I was through with case as he asked for my bill. I had no intimation that danger was impending. During the afternoon of the same day, he felt slight pains in lower abdomen. At about 6 P. M. he was taken with very severe pain in left iliac region. I saw him at 7.30 P. M. His bowels had moved three times and he passed flatus which relieved him. Temperature 104, pulse 128. At 6 P. M. he had a severe chill, followed by a cold sweat. He was tender in lower abdomen and especially in left iliac region. Perforation of bowel was suspected. Morphine sulph. $\frac{1}{4}$ gr. and digitalin 1-100 given.

December 9th patient's condition apparently improved. Pulse 100; temperature 101; bowels moved four times; slight griping pains; very little distension. Only light liquid diet.

December 10th pulse 100; temperature 99 $\frac{1}{2}$; five watery stools; occasional griping pains; little tenderness and distension. Diagnosis made on the above symptoms. Enteritis.

December 11th pulse 128; temperature 103. Absolute constipation, marked distension and tenderness below umbilicus. Pain great, anxious look and restless. Diagnosis: Peritonitis from perforated typhoid ulcer.

Patient put in Fowler's position. Murphy drip in rectum. Morphine sulph gr. $\frac{1}{4}$ and digitalin 1-100 every four hours. All nourishment withheld save egg white and water, two teaspoonfuls every hour.

December 12th 300,000,000 each of the streptococcus and staphylococcus was given.

The family was advised that the patient's interests lay in surgical measures, which was refused.

December 12th Dr. Crawford saw the case with me again, and agreed with me fully.

December 14th patient given 300,000,000 each as on December 12th; turpentine stupes had been used freely, with relief to the patient. Condition improved. Pulse, temperature, distension and tenderness all better.

December 16th patient better. Pulse 80.

Tenderness all gone. Distension nearly all gone. Bowels had not moved. Drip continued. Only teaspoonful doses of egg water and peptonized milk given. Patient looked as if he was going to get better.

December 19th temperature commenced to go up. Passed a great deal of flatus.

December 20th patient very weak. Had severe attack of pain in lower bowel region. Had fainting spell. Pulse very weak and rapid. Became comatose and died in a few hours.

In connection with the above case, I make the following observations:

(1) That probably the nasal, pharyngeal and oral symptoms were part of the erythema multiforme.

(2) Although the etiology of erythema multiforme is held by authorities, as to be not of microbic origin, yet it seems reasonable, that a disease that causes an inflammation of the skin and mucus membranes, causing malaise and fever, and that may run a course of one or two months is of microbic origin.

(3) The absence of adenopathy of cervical glands in such violent inflammation of the nose throat and mouth.

(4) Whether the acute nephritis was caused by the toxins of the bacillus typhosus, the erythema multiforme or whether it was an extension upward of the cystitis.

(5) The late period in which perforation took place—four and one-quarter months after beginning of disease.

(6) That probably the streptococcus and the staphylococcus both played a prominent role, as secondary invaders. This is evidenced by fact that symptoms were ameliorated when vaccines of these bacteria were used.

(7) The case is unusual. Presenting two diseases running in same patient at same time. Its long course, and many and varied complications.

(8) It might be of interest to remark that about eight weeks of the patient's life was blotted out. He remembered nothing of his serious sickness, the catheterizings, the packs, or anything that was said or done.

(9) It is hard to understand why the respiration should act so well, keeping at practically a normal rate throughout the disease.

JOHN HUNTER.*

By EDGAR R. McGUIRE, M.D.,
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COULD we but picture the few dingy, cob-webbed rooms that constituted the medical college of a few years ago, its ghastly scenes and its equally distressing odors, we would thoroughly appreciate the adage, we live in an age of change. The modern palatial halls,

* Opening address at the University of Buffalo, September, 1911.

with their well-ventilated class rooms, and extensively equipped laboratories, stand out in strong contrast with the somewhat earlier picture. In fact, the whole aspect of medical teaching has changed beyond recognition in the last decade. In the earlier days of our medical history, men seemed to worship at the shrine of previous great men, like Hippocrates and more especially Galen. Any medical thought not entirely in accord with the expressed views of the so-called medical fathers was almost a sacrilege.

Surgery had been delegated to inferior people until it carried with it a certain opprobrium. It was not until 1745 that the alliance between the barbers and surgeons was happily dissolved. While previous to this time there had been great men in medicine, yet the true Baconian philosophy had never found its way into medical thought. In medicine it was true because some previous authority said so regardless of its foundation in fact. The credit of rescuing surgery from its low level and placing it on a scientific basis of truth, rests largely with John Hunter. He accepted nothing for truth until it was actually demonstrated. As he said to one of his pupils, Jenner, "But why think, why not try the experiment?"

Many young men commence the study of medicine with but meager preliminary education and embarrassed financial support. To such there is a message in the consideration of the life of John Hunter, for under similar conditions he rose to the very pinnacle of human greatness, shaking to the very foundation the medical structure of the day. John Hunter came of a very old Scotch family, the Hunters of Hunterstone, in Ayrshire. John and his illustrious brother, William, were descendants of the Calderwood branch of the family. John was born seven miles from Glasgow, February 14, 1728. There were ten children in the family, all of whom died early in life excepting John, William and one sister, Dorothea. James was the first son to reach manhood, but died from tuberculosis when he was twenty years of age. Of him his brother William said: "He was the brightest in the family, and had he lived would have become the first physician in London." Dorothea married the Rev. James Baillie, and is of interest to us because the only Hunterian descent is carried out through this branch of the family. Her son, Mathew Baillie, became prominent in the medical profession and was called one of the "masters of medicine." Joanna, her daughter, was the "Immortal Joanna," one of Sir Walter Scott's closest friends.

The age in which John Hunter grew into manhood was a stirring one in the history of the world. England had been in the throes of a revolution, which witnessed the final overthrow of the Stuarts and the ascent of the house of Hanover. In the early part of the eighteenth century all English people were thrilled at the

victories of Marlborough. Robert Walpole had made a beginning of free trade in England, which so replenished the treasury that William Pitt was later able to successfully carry out the seven years' war. Frederick the Great was making his gallant fight during John Hunter's early days in London.

In literature the great name of Shakespeare still dominated. Ben Johnson was honored by his side. Francis Bacon had led men's ideas back to philosophy and science. Milton's "Paradise Lost" and Bunyon's "Pilgrim's Progress" had left their imprint. John Dryden died twenty-eight years, and Sir Isaac Newton one year, before Hunter was born. In art, Rubens had died in 1640; Van Dyke in 1641; Tenier in 1644; Rembrandt in 1669. This was the great age in which John Hunter was passing his boyhood days.

Through his youth he excelled in games of all kinds, but was deficient in self-control. He was idle and ignorant—a very great disgrace for a Scotch boy living within walking distance of Glasgow College. Beside, his father was a gentleman and his two brothers were studying law and medicine. He later said of his boyhood: "I wanted to know all about the clouds and grasses, and why the leaves changed in the autumn. I watched the ants, bees, birds and tadpoles; I pestered people with questions about things nobody knew or cared anything about." He disliked books, but loved to roam in the fields with nature. Even later in life, when urged to spend some time at Oxford, he would have none of it. He said: "They wanted to make an old woman of me, or that I should stuff Latin and Greek at the University; but these schemes I cracked like so many vermin as they came before me." Later in life he was accused by Jesse Foote of not understanding the dead languages. He replied by saying he could teach Foote that on the dead body which he never knew in any language living or dead. He little realized how his education after nature's way was exactly what his brain required. With the ordinary school training his mind would have been warped beyond recognition, instead of developing unhampered into a master mind.

He worked for a few months helping his brother-in-law in a carpenter shop, but this was very distasteful to him, and at twenty years of age we find him on his way to London to join his brother, William, where he found work to his liking. Particularly fortunate is the young man who has found his true vocation in life. In his correct sphere one works gladly even in the ranks; but on the other hand, how irksome daily toil must become when one has mistaken his calling. Many a brilliant mind has missed the chance of doing something worth while because of an unfortunate choice early in life.

William Hunter himself was enough to make the name of Hunter forever memorable. If

John did at last surpass him, it was William who gave him the start, and for years was the guiding spirit of the brothers. William was ten years the older. He was diligent in school, and grew to be a refined, cultured gentleman. In 1740 he attended the great Alexander Monro's lectures at Edinburgh, and one year later established himself in London. He became assistant to Dr. John Douglas, and entered as a surgeon's pupil at St. George Hospital. In 1748 we find him giving a course of anatomical lectures. The same year he visited the continent, and was joined in the fall in London by his brother, John. His fame grew rapidly. He was made *Accoucheur* to the Middlesex and British Lying-in Hospitals. In 1770 he received a degree of M.D. from Glasgow. His greatest literary effort was a magnificent atlas: "Anatomy of the Gravid Uterus." It is even yet, perhaps, the greatest work ever written on this special subject. The great Hunterian Museum of Glasgow was bequeathed by William Hunter on his death to that university, and stands as a splendid monument to the founder. William was an accomplished university product—an agreeable, interesting speaker and a popular teacher. He was dignified and pleasing in conversation, all in strong contrast to his brother, John.

When John reached London he was a raw country lad, ambitious but rude, outspoken and intolerant to others. It is no wonder that this crude specimen seemed a rather discordant note to his more cultured brother. John started his work by dissection of a forearm which William was to use later in his lectures. He liked the work, and did it so well that it brought forth the warmest praise from William. His improvement was so marked, the next year he was put in charge of the dissection room and allowed to instruct certain pupils. It is during this time that we hear of escapades which rather detract from his character. We find him in the theater in "the gods" interrupting the performance, drinking to excess and associating with the lower types around him. There is a time in almost everyone's life when such things appeal strongly to him. It is a most critical time, because, if he falls permanently into such habits, there is no chance of ultimate success; but if on the other hand these days pass with only a few scars, he may be none the worse for his experience. Fortunately John Hunter was of too sterling a type to be dragged down by these surroundings, and soon abandoned them for the higher and better things of life.

This was a most important time in this young man's history. He is reported to have been untrained in letters and ignorant of the work already done in medicine and allied sciences. How can we associate this with his work of a few years later, when he was a valuable contributor to all discussions of learned men of his time? His brother, William, is known to have had

around him all of the best men of London; in fact his house was their rendezvous. It was here John breathed an atmosphere of science, and doubtless the influences he received at these meetings had a pronounced effect in producing the finished product of later life. He became a pupil of the great Chelselden and later of Percival Pott. In 1754 he became pupil surgeon in St. George's Hospital and two years later house surgeon. Here we find the beginning of his surgical career. He remained true to the dissecting room, however, keeping up his work for his brother's lectures. He was now thirty-one years old, and had worked eleven years at dissection. Compare this preliminary training for a surgeon with that of our young graduates of modern times. The latter's diploma has scarcely dried before we hear in the public press of his supposed brilliant surgical feat. In this respect we have advanced too far, and it is to be hoped that the public will insist through the law-makers that the surgeon of modern times will receive no less thorough training than those of a century ago.

During these years in the anatomical room, he had discovered the connection between the placenta and the uterus; he made very thorough dissection of the lymphatics, probably one of the first to do so; and also described the true relation of congenital hernia. While some of this work was done before, as Haller's work on hernia, yet Hunter was not familiar with it at the time, and therefore it is equally meritorious.

Hunter's health began to fail and life in London was interrupted by a year as an army surgeon. This was the year 1759 a memorable one in English history. It was at the end of this year that Horace Walpole laughingly remarked: "We are forced to ask every morning what new victory there is, for fear of missing one." By the victory of Rossback, began the re-creation of Germany. In the victory of Quebec began the real history of the United States, and in the victory of Plassey the influence of Europe told for the first time since Alexander on the nations of the East.

Hunter's army experience was later recorded in a book on "Gun-shot Wounds." During this time he studied the digestion of snakes during hibernation. After his return he made out a catalogue of his specimens, having recorded over two hundred normal and diseased structures. This experience in public work reminds one of several other great men, notably Darwin.

He now entered the practice of surgery under the usual predicament of no practice but plenty of time. Every man passes through this stage, some more than others. This precious time of waiting for business is frequently wasted, but Hunter spent it in the study of comparative anatomy. He applied to the Zoo for all of the animals that died so he might dissect them. He had a similar standing order with all the animal shows, and he paid out a considerable sum for

rare specimens. His zeal is well illustrated in the story of the Irish giant. Hunter wanted the body and the giant knew it. In order to escape, the giant made his friends promise to bury his body at sea, but Hunter learned of it and bribed the undertaker. When the giant died and they were marching to the sea for burial, Hunter's money gave them a liberal supply of liquor, and during the debauch the body was removed from the coffin and replaced by stones. While the Irish friends were solemnly burying the stones at sea, Hunter was boiling the body of the giant in a large kettle to rapidly secure the skeleton. In bribes, etc., this episode is supposed to have cost Hunter nearly five hundred pounds.

In 1767 he was made Fellow of the Royal Society of Surgeons, a great honor, as at this time he had published comparatively little. His brother, William, did not receive this honor until several years later. Hunter's routine day consisted of work in the dissecting room from five-thirty until nine. He then ate a hasty breakfast, and from then on until twelve he saw patients in the office. At noon he made his hospital and private calls, returning for dinner at four P. M. After sleeping an hour he worked with his friends and pupils until midnight. His passion for scientific work delayed his success as a surgeon, as he devoted to collecting, etc., every hour he could snatch from practice. While at work one evening a patient called to see him, and after some delay he remarked to Lynn: "Well, I must go and earn this damned guinea or I shall be sure to need it tomorrow."

He established a foothold at Earl's Court, outside of London, and no one could have passed this original spot without deep curiosity. In the rear of the house the lawn was stocked with fowl and queer animals unknown in these parts. Four lions guarded the entrance, and dangerous animals were kept in what he called the "Lions' Den." In a pond facing the sitting-room were kept fish, frogs, leeches and eels. Of animals we find buffalo, jackals, ostrich and leopards; also bats, snakes and birds of prey. The *Morning Post*, August, 1793, says: "In the garden of Mr. John Hunter, surgeon, Earl's Court, are seen buffalo, rams, sheep from Turkey, shawl goats from East India all feeding together in greatest harmony, beside a prodigious variety of beasts and birds supposed to be hostile to each other." Before he died his household, including his wife and two children, consisted of over fifty people. This included several students, but for the most part they were servants, both in London and Earl's Court.

A mere catalogue of his work would be impossible to give you at this time; suffice it to say he made dissection of at least 500 different species of animals, exclusive of repeated dissections of different individuals of the same species. These represented only a small part of his collection. He added thousands of prepara-

tions in human anatomy and pathology, skulls of all nations, two thousand stuffed animals and three thousand fossils; the whole collection of which has been estimated at over 13,000 specimens, and yet this is but a part of his work. He was forever experimenting in the development of eggs. For years he watched bees and wasps. He says of bees, that he killed several hives and examined every single bee to assure himself that no male bee was left after fertilization of the queen bee had been effected. The number of laborers in a hive number at least four thousand, so that he examined from twelve to fifteen thousand to determine this one point. (Powers.)

Finally he recorded everything he did with infinite patience. He left enormous quantities of manuscript at his death, describing in detail his work. A large part of this is still in existence, but many volumes have been lost, the story of which is most distressing. Edward Home, who was Hunter's brother-in-law, was for years a favored pupil and upon Hunter's death stepped into his shoes. The manuscripts were left with Home, as one of the executors of the will. Although absolute proof is lacking, it is generally believed that Home stole the contents of these papers for the second volume of his lectures on comparative anatomy. In his later days he became anxious to appear before the world as a discoverer, and this desire evidently led him to stoop to things his friends greatly regretted. The Royal College investigated the whole matter, as a result of which Home still retained his seat in the Council because he claimed it to be Hunter's wish that the manuscript should be destroyed.

The Hunters had many quarrels. This unpleasant part we will but briefly mention, because it has no great bearing on the influence of the men. William, especially, quarreled with the Monros of Edinburgh and Percival Potts on essential points: (1) the discovery of the lachrymal ducts in man; (2) the discovery of tubule seminiferi; (3) the knowledge of the true nature of congenital hernia; (4) the discovery of the lymphatic system. These we will leave, important though they may be, because we could not settle them. A more serious and unfortunate quarrel arose between the two brothers, creating an estrangement which was never really repaired. In 1780 John Hunter communicated a short paper to the Royal Society on "The Structure of the Placenta." In May, 1754, after a dissection by another, John claims to have first recognized the true relation between the placenta and the uterus. William Hunter likewise claimed the same discovery, and several unpleasant letters were written by both of them to the Royal Society. The society refused to take up the controversy. The bitter feeling lasted for many years between the brothers, in fact, until William, on his death bed, sent for his brother, John.

That everything was not harmonious is shown by William's will, because he failed to make John his executor, and his two most prized possessions—his museum and the family home at Calderwood—were not given to John, the most likely heir. The museum was given to the University of Glasgow, and the family home later became the property of Dr. Mathew Baillie, his nephew. Dr. Baillie, himself one of the masters of medicine, recognized the injustice and of his own free will deeded the property to John Hunter.

One of the greatest monuments to John Hunter lay in the great men who were his pupils. What a tribute to have been the teacher of Edward Jenner, the discoverer of vaccination; Sir Ashley Cooper, who, in addition to being great, is credited with making more money out of medicine than any other man. Beside these were John Abernathy, Henry Cline, Sir Edward Home and a host of other men, not to mention our own famous Dr. Phillip Physick, who is called the father of American surgery.

The intimate relations existing between John Hunter and Edward Jenner is delightful. These two men, scarcely equally great, whose correspondence beams with action, on the one hand instructions for all sorts of experiments and collections and on the other with reports of progress, makes a picture unique in the history of our profession. Upon different occasions Hunter pressed Jenner to join him in London, but to no avail. Each had his work to do and did it well. Listen to a few sentences from Hunter's letters: "I thank you for your account of the cuckoo. I am told there is the skin of a toad in Berkley Castle that is of prodigious size. Let me know the truth of it, its dimensions, what bones are still in it, and if it can be stolen by some invisible being. I buried two toads, last August was a twelve month. I opened the grave in October and they were well and lively. Have you any queer fish? Repeat all your experiments on the hedgehog. I have but one order to send you, which is to send everything you get, either animal, vegetable or mineral, and the compound of the two either animal or vegetable mineralized." Indeed, Jenner must have been kept busy, because Hunter was only satisfied with the most painstaking work. He took nothing for granted, as is shown by his reply to Jenner regarding the temperature of the hedgehog: "I think your solution is just, but why *think*? why not try the experiment?" He further adds: "Try the heat, cut off a leg at the same place, cut off the head and expose the heart and let me know the result of the whole."

Hunter's success as a writer was somewhat impaired by his meager knowledge of correct English. Notwithstanding his lack of scholarship and the labor expended upon it, he was a prolific writer. His first systematic work was a treatise on the natural history and diseases of the human teeth. Previous to Hunter's time, dentistry was

in a deplorable state. It was almost entirely in the hands of the barbers or ignorant mechanics. To Hunter is due the credit of placing dentistry on a broad scientific basis, showing the physiological and pathological relation which the teeth bear to the whole body. He also successfully transplanted teeth from the mouth of one person to that of another. We imagine Hunter's delight when he successfully transplanted a human tooth to the comb of a cock. His treatise on venereal diseases was for half a century the best authority in any language. His experiences during the war gave him a wealth of material, and his object was to discard the old works which had been copied from one to the other for centuries, and to establish a modern work based on his own actual experience. His description of the indurated chancre is so graphic that it is still called by his name. The treatise on the blood, inflammation and gun-shot wounds was a great undertaking—one which cost him a large expenditure of time and labor. It is upon this work that his fame as a surgeon largely rests. A complete edition of all his works was issued in 1837 under the supervision of James F. Palmer, assisted by Ottley, Bell, Babington and Owen.*

Notwithstanding his great knowledge of anatomy, Hunter never ranked high as an operating surgeon. He was a surgical pathologist rather than an operator. In fact, he maintained an operation was a reflection on the healing art—a tacit acknowledgment of the inefficiency of surgery. Such a view could hardly be entertained today, even by its strongest opponents. As a result of this feeling, Hunter accomplished very little in the strictly operative way. The only remarkable operation with which his name is associated being for aneurysm. He tied the femoral artery for popliteal aneurysm, a feat never before accomplished. It was important because he instituted a new principle—that of ligation on the cardiac side in healthy tissue. In 1767 he ruptured his tendo achilles, and this led him to institute experiments on the dog by subcutaneous division with a couching needle. After a time the animals were killed and union was found to have taken place. While this might be considered the beginning of orthopedic surgery, it was not until half a century later that Stromeyer placed this subject in its true light.

In his later years Hunter experienced many quarrels with his associates. They were jealous of his ability and success, and everything possible was done to oppose him. At a meeting of the governors and staff of St. George's Hospital, Hunter made a statement which was immediately flatly contradicted. He choked with anger, ceased speaking and hurrying into an adjoining room fell lifeless into the arms of one of the attending physicians. He had long suffered with angina pectoris, and this was evidently the cause of the

* A copy of the work is in Dr. Clark's library, and I am much indebted to him for the privilege of consulting it.

last attack. Strange that he who had given his best work for the hospital, whose fame had made it famous and whose name had been its chief ornament for years, should pass away in a petty quarrel in its defense. He was buried in the Church of St. Martin in the Fields in 1793, but in 1859 the Royal College of Surgeons had his body transferred to Westminster Abbey—that sacred depository of England's famous men.

Upon his death there was considerable difficulty in disposing of his museum. When Pitt, the prime minister, was asked regarding the government buying it, he exclaimed: "What, buy preparations! why, I have not money enough to buy gunpowder." Finally sufficient influence was secured so it became the property of the Royal College of Surgeons. In 1830, chiefly through the influence of Dr. Mathew Baillie and Sir Edward Home, provision was made for an annual Hunterian oration given on his birthday. This oration has been given by men holding the very highest position in our profession. Since 1850 it has been given only every second year, it being considered a hopeless task to seek for something new every year on so limited a subject.

By constant additions the Hunterian Museum forms the largest collection of anatomical, surgical and zoölogical preparations in the world. In pathological specimens only, the Dupuytren's Museum in Paris is its nearest competitor. The original Hunterian Museum contained over 14,000 preparations with a description of each. Annexed to it now is the library of the Royal College of Surgeons, now numbering over 38,000 volumes and 39,000 reports, reprints, etc.

In person Hunter was of medium height, strong and robust, with short neck and broad shoulders. He possessed great endurance, requiring only a few hours' sleep. His manner was cold and reserved and although naturally kind, he often betrayed ill feeling and bad temper. It is related of him, on returning home late one evening after a hard day, he found a party of ladies and gentlemen, his wife's guests, assembled in his drawing-room. He was very angry and exclaimed: "I ought to have been informed of this kickup, and as I have come home to study, I hope the company will retire." Mrs. Hunter was a refined, cultured woman, and one can imagine her mortification at such inconsiderate conduct. Hunter was fond of animals, was kind to them and would often spend hours watching their pranks. He was loved by his pupils—Jenner always referred to him as the "dear man"; so in the main we must conclude that he was an amiable man excepting under the strain of overwork.

Quoting from Gross, "John Hunter and His Pupils": "Somewhat over a century has elapsed since the death of this remarkable man, this apostle of surgery, this high priest of nature. Although he is dead, the spirit which animated him will live for ages to encourage and stimulate

the student of surgery, of science and of human progress. His example of industry and steady persistent effort in the cause of human progress reflects the highest credit upon his character and is worthy of imitation of every student ambitious of distinction and usefulness. Nowhere, either in ancient or modern times, can there be found a nobler pattern for the foundation of a truly scientific career. Commencing life as an erratic, hesitating youth, undecided what to do or whither to turn, without any purpose or definite aim, a source of constant annoyance to his family and disappointment to his friends, he became one of the most illustrious men of Europe, leaving behind him imperishable monuments of patient research, of vast genius and of masterful philosophical acumen, destined to grow broader and more stately as years roll on, and as men become more and more appreciative of man's work and man's intellectual powers." Again, "A man of vast designs, of noble deeds and extraordinary genius, one of those rare beings whom an all wise Providence at long intervals sends into the world to astonish and enlighten mankind, and to direct the human intellect into new channels of thought and action." "The sparks which were emitted by Hunter's genius kindled a flame which set the medical and scientific world on fire." "Had he been a frequenter of the drawing-room, theatre, concert and opera, he might have secured an honorable reputation, but he would have fallen far short of that transcendent flame which he has bequeathed to his profession and his country, and which has immortalized alike his name and his noble work." "So, finally, rests this bright representative of the great lights of the last century of mighty genius,—a century that has been a bank of knowledge and wisdom on which we of this century have lived and flourished. In these money-grubbing, fee-gulping, pedantic, hard, matter-of-fact days, with their hide-bound educational formulas, he would have been nowhere. The very college where he is worshipped would have plucked him like a shot as one fit only to be sent back 'old chairs to mend.' Happy for him and for us that working in freedom from the tyranny of much cramming, his immortal mind was permitted to run its immortal course." (Richardson.)

"MEDICAL SCHOOL INSPECTION."*

By THOMAS E. BULLARD, M.D.,
 SCHUYLERVILLE, N. Y.

WHAT have we as health officers to do with the schools? We have a state department of education and local boards of education, and, in the district schools, the newly-created office of school director. They

* Read before the Annual Meeting of the New York State Sanitary Officers' Association, at New York City, October 24, 1911.

lay out and prescribe courses of study and the amount of work the children shall do. They look after the housing and care of the children while at school, including the privilege of sending home any child not vaccinated or suffering from any contagious disease. As long as our school authorities attend to these things, why should we concern ourselves about the schools?

The facts are that the child or its parent generally finds out that he or she is ill before the school authorities. They send for a physician. If contagious, the case is reported or at least kept from school, and so the matter is got along with somehow. Of course occasionally a disease becomes epidemic and it becomes necessary for the health officer to step in and close the school. But ordinarily I think the masses of school children are pretty well protected against contagious disease, be it smallpox or what-not.

Then why any more medical inspection of schools? The child is protected in a measure, at least, from smallpox, diphtheria and scarlet fever; is taught the evils of alcohol and tobacco; and can tell you all about the process of digestion and the circulation of the blood, but the number of choric, underdeveloped, puny children attending our schools is evidence that something is wrong with the school system itself, which controls such a large portion of the time of every child's life of school age.

The Department of Education says that every child should have a certain minimum amount of education. Parents will get them out of school as soon as possible and so we must get them in as early as possible and crowd them just as hard as we can while there. Consequently, children five years old are already in school. By the time they are nine years old they are doing work altogether too far in advance for them. Not only that, but I don't believe that any child who enters school at five years of age ever gets his growth. Half of a dinner swallowed hastily, and digested while bending over a desk; a supper digested while studying and the struggle in the evening to get a page of arithmetic, never make a full-sized, healthy man or woman. All brain workers who have maintained their efficiency for any great number of years agree that it is entirely wrong to work evenings, even in adult life, and we certainly should not expect more from a child than from a mature individual.

A large percentage of children acquire tuberculosis early in life—some writers say as high as $33\frac{1}{3}$ per cent.—from which, under favorable conditions, many recover, but what chance does such a child have in a country school house with double windows and absolutely no visible means of ventilation? The school trustee's idea is coal, taxes and economy as well as giving education. The plan of the state department and of local boards of education is to give all the children as much education as possible in the least possible time. They probably mean all right, but the

whole educational system needs medical inspection from the state department to the janitors of the district schools.

There should be a medical man in connection with the State Department of Education whose especial business should be to see that the courses of study are such that the ordinary child can pursue them without interfering in any way with its health or physical development.

It should be the business of the local health officer to periodically inspect every school within his jurisdiction and take note of and pass upon its cleanliness, light, heating and ventilation. He should also take an interest in and inform himself in regard to the school work that he may at least have some idea as to whether or not the methods employed are inimical to the physical well being of the child. His opinion should be something more than advisory. If he hears of a child coming home with thirty-three examples to do in one evening, he should make an investigation at once, and find out whether the state department has laid out a course of study which makes such a thing necessary, or whether the individual teacher is just trying to subdue the children. Some of the teaching in the schools remind one of the method of breaking a colt by getting it harnessed and then driving it until it did not have life enough to switch its tail.

We want all of our children to have active, well-trained minds, and a fair amount of proficiency in study, but I do not think that the acquirement of a great amount of knowledge during the first few years of life is an assurance that a child will have that sort of a mind which we so much desire. On the contrary, I have known of several young men and women who, while at school, were the head of the class but who for several years afterward seemed to be just about dead from overtraining, with their brains full of cinders, while some fellows not half so smart in school were in every way their mental and physical superiors.

Occasionally a prodigy at school maintains his meteoric career for a few years, but a majority of them do not need chloroforming at sixty. I believe that observers agree that the majority of those people whose careers whether in the realm of thought or endeavor stand out preëminently as to its quantity and quality were moderate workers during their school life.

The school system is not to blame for all of the choric, underdeveloped children that are in them, but the simple acquirement of a great amount of knowledge does not necessarily make educated men and women. In the acquirement of knowledge we should not attempt to speed on the first quarter that should only be hoped for on the home stretch. It should be someone's business to take an interest in this matter of education, who can see it from a broader standpoint than the man whose one idea or whose principle idea has been that of education. At the present

time I know of no one better qualified to do this than the health officer, and I do not know of anyone who would be so well qualified to inspect the work of the State Department of Education, or to confer with them as a representative of the State Department of Health or someone in equally close touch with the health officers of the state who in turn should be in close touch with the schools in their respective localities.

ANNOUNCEMENT.

A meeting under the auspices of the West Side Branch of the Chicago Medical Society and the Chicago Medical Society, held in Chicago April 17, 18, 19, 1912, for the purpose of discussing mental diseases in their various phases. Alienists and Neurologists from different states have been invited to participate in this meeting. The object of the meeting is for scientific purposes for those engaged in this line of work, educational to the general practitioner and instructive to the public.

The following is a partial list of those who will attend:

Drs. Henry A. Cotton, Trenton, N. J., Heredity, with charts of from two to four hundred cases that his Asylum has investigated; T. B. Throckmorton, Cherokee, Iowa, "Clinical Significance of Reflexes;" H. A. Tomlinson, St. Peter, Minn., "Mental Depression;" W. F. Lorenz, Mendota, Wis., "Chemical and Cytologic Findings of the Blood and Spinal Fluids;" K. S. West, Cleveland, Ohio, "Clinical Reports of One Hundred Cases of Paresis and Serologic Findings;" Fred W. Terfinger, Logansport, Ind., subject not received; Sidney I. Schwab, St. Louis, Mo., "Abnormal States in Otherwise Normal Individuals;" David F. Weeks, Skillman, N. J., title of paper not received; H. M. Cary, Pennhurst, Pa., "Feeble Minded and Epileptic;" H. P. Sights, Hopkinsville, Ky., "Infectious Psychoses;" J. L. Green, Little Rock, Ark., title of paper not received; W. L. Treadway, Jacksonville, Ill., "The Presenile Psychoses;" C. H. Anderson, Menard, Ill., "Some Causative Factors of Criminality Found in Mental and Nervous Conditions;" Chas. Bernstein, Rome, N. Y., "The Need for Permanent Custodial Care for Defective Juvenile Delinquents;" Theo. Diller, Pittsburg, Pa., "The Menace to the Public of Imbeciles Living Outside Institutions;" and from the State of Illinois there will be papers from Drs. Singer, Norbury, Read, Pollock and Clara Town.

The Medical Society of the State of New York

The president, Dr. Phillips, has appointed Dr. William F. Mittendorf of New York as delegate to the Committee on Establishment of a Physicians' Sanatorium of the American Medical Association.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF RENSSELAER.

REGULAR MEETING AT TROY, MARCH 12, 1912.

SCIENTIFIC PROGRAM.

"Lanes-kink. Cause of pain after Removal of Appendix," C. F. Kivlin, M.D., Troy.

"Carriers of Disease," with lantern slide exhibit, Wm. A. Howe, M.D., Albany, Deputy Health Commissioner New York State.

"Some Features of the Theory and Practice of Medicine in the 17th Century," A. S. M. Chisholm, M.D., Bennington, Vt.

"X-ray demonstration of some interesting cases," John J. McShane, M.D., Troy.

MEDICAL SOCIETY OF THE COUNTY OF SCHENECTADY.

REGULAR MEETING, AT SCHENECTADY, MARCH 12, 1912.

SCIENTIFIC PROGRAM.

Lantern Demonstration, Treatment by Salvarsan. Howard Fox, M.D., New York.

MEDICAL SOCIETY OF THE COUNTY OF MONROE.

REGULAR MEETING, AT ROCHESTER, MARCH 19, 1912.

SCIENTIFIC SESSION.

"A Report of an Investigation of the Municipal Milk Production and Distribution," illustrated, John R. Williams, M.D., Rochester.

"Relation of Bovine Tuberculosis to Public Health," Joseph Roby, M.D., Rochester.

MEDICAL SOCIETY OF THE COUNTY OF ALBANY.

REGULAR MEETING, AT ALBANY, MARCH 12, 1912.

SCIENTIFIC SESSION.

SYMPOSIUM ON THE STOMACH.

"Anatomy," H. H. Drake, M.D., Albany.

"Symptoms and Diagnosis," Malcolm Douglas, M.D., Albany.

"Treatment," L. H. Neuman, M.D., Albany.

"Surgery," C. W. L. Hacker, M.D., Albany.

"Gastric Disturbances of Infants," H. L. K. Shaw, M.D., Albany.

MEDICAL SOCIETY OF THE COUNTY OF MONTGOMERY.

REGULAR MEETING, AT AMSTERDAM, FEBRUARY 15, 1912.

SCIENTIFIC PROGRAM.

Dr. James B. Conant presented an interesting report on the county fee bill which, after a discussion by the members present, was accepted by the Society.

"Radiography in Intestinal Stasis by Alfred C. Jordan, M.D., London, England," illustrated with lantern slides, H. M. Hicks, M.D., Amsterdam.

LEGISLATIVE NOTES.

A hearing was held in Albany before the Committee on Codes of the Assembly, on Wednesday, March 13th, on Assembly bill, Introductory 768, Printed No. 825, by Mr. Barnes, "To amend section one hundred and eighty-five of article sixteen of chapter eighty-eight of the penal laws of the State of New York." The Medical Society of the State of New York was represented at this hearing by Dr. Ewing of Cornell University, Prof. Lee of Columbia University, and Mr. Jerome D. Greene of the Rockefeller Institute. The bill was not reported out of committee.

BILLS INTRODUCED INTO THE LEGISLATURE.

January 1, February 23, March 22, 1912.

IN ASSEMBLY.

Adding a new section 318 to the Public Health Law, providing that all mattresses shall be labeled showing the nature and quantity of materials used in their manufacture, prohibiting the use in mattresses of materials previously used by or about hospitals, or persons with infectious diseases. Violation is a misdemeanor. By

Mr. Hoff. To Public Health Committee. Printed No. 1029. Int. 932. Passed.

Amending section 4 of the Public Health Law by providing that the Commissioner of Health shall have general supervision over the sanitary condition of the Indian reservations in the State, and shall make necessary regulations for the preservation of health and the execution of public health laws in the reservations. By Mr. Bush. To Public Health Committee. Printed No. 1063. Int. 967.

Providing for the appointment by the Governor of a commission of two Senators and three Assemblymen, to select and purchase a suitable site in Oswego river valley in the fifth judicial district for the establishment of a State Hospital for the Insane, subject to the approval of the next Legislature, to which the commission may report within ten days after the commencement of the session, and appropriating \$5,000. By Mr. Sweet. To Ways and Means Committee. Printed No. 1095. Int. 989. (Same as S. 714.)

Amending sections 4, 5, 20, 21 and 23 of the Public Health Law by providing that when a local board of health in a town or village neglects to perform its duties, the state commissioner shall have power to exercise their powers, the charges incurred to be charged to the municipality, and where a nuisance exists within the jurisdiction of two or more municipalities in which the local boards do not agree as to their respective powers, the commissioner may abate the nuisance and determine the expense to be paid by each municipality and making other provisions. By Mr. Brown. To Public Health Committee. Printed Nos. 1190, 1311, 1584, 1792. Int. 1053. Reported amended.

Amending sections 310 and 311 of the Public Health Law by striking out the provision that no unvaccinated person shall be received into any of the public schools of the State, and providing that the trustees of a school district, or board of education of a Union Free School district or city may exclude unvaccinated persons from a school whenever an epidemic of smallpox exists in the vicinity and the board of health notifies the trustees that such an epidemic exists. By Mr. Cheney. To Public Health Committee. Printed No. 1201. Int. 1064.

Adding a new section, 334a, to the Public Health Law, making it a misdemeanor to repaper or rekalsomine walls or ceilings of buildings or rooms used or to be used by human beings for tenements or working purposes, in cities or villages of 10,000 or more inhabitants without first removing all old paper or kalsomine and thoroughly cleaning the wall. By Mr. Wende. To Public Health Committee. Printed No. 1202. Int. 1065. Reported.

Amending section 330 of the Oswego charter, and adding ten new sections, relative to the construction of two additional trunk sewers, by authorizing the city to issue bonds in such amounts as the common council may determine therefor, when a proposition therefor has been approved by the voters, at not exceeding 4½ per cent. interest, regulating the portion of the cost to be borne by the abutting property and the city, respectively, and making other provisions. By Mr. Sweet. To Cities Committee. Printed No. 1228. Int. 1085. Reported.

Making appropriations for maintenance, equipment, constructions, improvements and repairs at Letchworth Village and other State institutions under the control of the State board of charities; also for State hospitals for the insane and State prisons, and for the State agricultural and veterinary colleges at Cornell. By Mr. Whitney. To Ways and Means Committee. Printed Nos. 1272, 1699. Int. 1106. Reported amended.

Authorizing the city of Buffalo to issue not exceeding \$2,000,000 for constructing public trunk sewers and for enlarging existing trunk sewers at not exceeding 4½ per cent. interest. By Mr. Page. To Cities Committee. Printed No. 1267. Int. 1119. Passed. (Same as S. 776.)

Adding four new sections, 350 to 353, to the Public Health Law creating a board of examiners consisting of three members appointed by the Governor, one to

be a surgeon, one a neurologist and one a practitioner of medicine, each with at least ten years' experience, to examine feeble-minded, epileptics, criminals and other defective inmates in State hospitals for the insane, State prisons, reformatories and charitable and penal institutions and to perform operations to prevent procreation by such persons when in the board's judgment the offspring of such persons would inherit a tendency to crime, insanity, etc. Persons so examined and operated upon are to be represented by counsel. By Mr. Bush. To Public Health Committee. Printed Nos. 1291, 1742. Int. 1137. Reported. (Same as S. 816.)

Adding a new section 1083-a to the Greater New York charter, providing that the Board of Education shall furnish free eyeglasses or spectacles to pupils of the public schools who need them, and authorizing the Board of Estimate to raise annually sums necessary to carry out this provision. By Mr. A. J. Levy. To Cities Committee. Printed No. 1329. Int. 1159.

Adding four new sections, 173 to 176, to the Insanity Law, authorizing the commitment of inebriates to the Providence Retreat for the Insane in Buffalo, by the judge of a court of record in the county or district where the inebriate resides, or by a judge of the city court of Buffalo, upon the consent of the trustees of the institution, and regulating such admission. By Mr. MacGregor. To Codes Committee. Printed Nos. 1330, 1835. Int. 1160. Reported.

Dividing Oswego county into two coroner's districts, and providing that hereafter there shall be two, and only two, coroners in the county, one in each district, who are to receive a salary to be fixed by the board of supervisors of the county, and which may be different for each district. By Mr. Sweet. To Internal Affairs Committee. Printed Nos. 1342, 1590. Int. 1172. Reported amended.

Appropriating \$15,000 to provide an adequate water supply for Kings Park State Hospital. By Mr. Whitney. To Ways and Means Committee. Printed No. 1373. Int. 1203. Passed. (Same as S. 847.)

Amending section 234 of the Public Health Law so as to require every proprietor of a pharmacy or drug store, who is not a licensed pharmacist or druggist, to have displayed on the exterior sign of the building, in addition to his name, the word "non-pharmacist," or "non-druggist," as the case may be, and on labels of drugs sold, and if a corporation, the exterior sign must contain the names of the president, secretary and treasurer, and the names of the board of directors. By Mr. Barnes. To Public Health Committee. Printed No. 1435. Int. 1244.

Appropriating \$200,000 for the construction of additional buildings and equipment on the grounds of the New York State Hospital for the Care of Crippled and Deformed Children at West Haverstraw. By Mr. Blauvelt. To Ways and Means Committee. Printed No. 1436. Int. 1245. (Same as S. 711.)

Amending subdivision 2 of section 30 of the Poor Law, relative to indigent persons requiring medical care and treatment, by providing that in Westchester county the charge for such care and treatment, as provided by the section, may be made not to exceed \$2 a day as at present. By Mr. Young. To Internal Affairs Committee. Printed No. 1448. Int. 1258. Passed. (Same as S. 891.)

Amending section 276 of the Village Law by providing that the board of sewer commissioners of a municipality or sewer district may contract for connection of the sewers with the sewers of another village, town or sewer district. By Mr. Allen. To Villages Committee. Printed No. 1472. Int. 1270. Passed.

Amending subdivision 21 of section 310 of the Education Law, by providing for the medical and dental inspection of school children at least once during each school year, and requiring the result of such examinations to be made part of the school records and a copy of the examination to be furnished to parents or guardian. By Mr. Merrill. To Public Education Committee. Printed No. 1525. Int. 1311.

Amending section 236 of the Public Health Law requiring that no pharmacist, drug clerk, or other employee in a drug store shall be required to work more than eight hours a day or forty-eight hours a week, except in order to make a shorter day of some day of the week, and providing that no drug clerk shall work for two pharmacists or drug stores more than eight hours a day in the aggregate. By Mr. Merrill. To Public Health Committee. Printed No. 1526. Int. 1312.

Authorizing the supervisors of Oneida county to establish and maintain a public hospital. By Mr. Allen. To Internal Affairs Committee. Printed No. 1539. Int. 1325. Reported. (Same as S. 771.)

Amending section 95 of the State Charities Law, by adding two new subdivisions 9 and 10, providing that the superintendent of the Rome State Custodial Asylum may grant any inmate a parole or leave of absence, and may admit to the asylum temporarily without commitment such children or adults as are suspected of being feeble-minded or idiotic, for observation purposes. By Mr. Cross. To Judiciary Committee. Printed No. 1555. Int. 1333. (Same as S. 1043.)

Incorporating the J. H. Dye Medical Institute for the manufacture and sale of medicines, medical preparations, consultations and operating in surgery, and prescribing medicines and furnishing care, attendance and home accommodations for invalids. The amount of capital stock is to be \$100,000. The corporation may advertise its medicines, etc. By Mr. MacGregor. To Judiciary Committee. Printed No. 1648. Int. 1405. Reported. (Same as S. 1010.)

Amending section 121 of the Public Health Law, by authorizing the health officer of the port of New York to sell at public auction any public property connected with the quarantine establishment which he deems useless. By Mr. Brown. To Public Health Committee. Printed No. 1722. Int. 1444. Passed. (Same as S. 1052.)

Adding a new section, 336-a, to the Public Health Law, making it unlawful for any person or corporation to expose for sale any fruit stuffs preserved in glass or earthen jars, or packed therein, unless the can or jar is plainly stamped showing the day, month and year when the food stuffs were placed therein. By Mr. Willmot. To Public Health Committee. Printed No. 1730. Int. 1452.

Authorizing the World's Dispensary Medical Association, in addition to its present powers, to take and hold property, including shares of its own capital stock, in trust to apply the same or the income thereof for the purpose of furnishing free medical and surgical treatment and hospital accommodation and attendance to worthy and indigent persons, and extending the corporate existence of the association for twenty-five years. By Mr. MacGregor. To Codes Committee. Printed No. 1842. Int. 1496. (Same as S. 1137.)

Adding a new section, 111-a, to the Labor Law, requiring bakeries to be licensed by the State Department of Labor after inspection by the health authorities of the locality and by the Department of Labor. The Commissioner of Labor is to close bakeries not so licensed. These provisions are not to apply to hotels, restaurants and boarding houses. By Mr. A. E. Smith. To Labor and Industries Committee. Printed No. 1903. Int. 1546. (Same as S. 1164.)

Adding a new section, 175, to the Public Health Law, providing that no physician employed in a professional capacity by a common carrier of passengers, or who is the physician for the employees of such common carrier, or who is recommended by the same, shall be connected with or employed by any city hospital. Physicians employed by common carriers or benevolent associations made up of employees thereof must file in the office of the county clerk where they are registered, a statement of such employment. Violation is a misdemeanor. By Mr. A. J. Levy. To Public Health Committee. Printed No. 1908. Int. 1551.

IN SENATE.

Authorizing the water commissioners of the village of Peekskill to issue \$10,000 of bonds for extending the water mains of the village. By Mr. Wainwright. To Villages Committee. Printed No. 705. Int. 661. Reported. (Same as A. 913.)

Adding a new section, 335, to the Public Health Law, making it a misdemeanor to repaper or rekalsomine any room used for living or working purposes by human beings, in cities or villages of 10,000 or more inhabitants until all the old paper has been removed and the wall thoroughly cleansed. By Mr. Ramsperger. To Public Health Committee. Printed No. 714. Int. 670.

Amending section 836 of the Code of Criminal Procedure, relative to proceedings where persons in confinement appears to be insane, by giving justices of the court of special sessions of a city of the second class concurrent jurisdiction with a judge of a court of record of the city or county, to call examiners in lunacy and conduct an investigation into the mental condition of the prisoner, and in a proper case commit him to a State institution for the insane. By Mr. Walters. To Codes Committee. Printed No. 754. Int. 704. (Same as A. 1921.)

Appropriating \$200,000 for the construction of additional buildings and equipment on the grounds of the New York State Hospital for the Care of Crippled and Deformed Children, at West Haverstraw. By Mr. Bayne. To Finance Committee. Printed No. 760. Int. 711. Passed. (Same as A. 1245.)

Authorizing the supervisors of Oneida County to establish and maintain a public hospital. By Mr. Ferris. To Internal Affairs Committee. Printed No. 840. Int. 771. Passed.

Authorizing the city of Buffalo to issue not exceeding \$2,000,000 for constructing public trunk sewers and for enlarging existing trunk sewers, at not exceeding 4½ per cent. interest. By Mr. Loomis. To Cities Committee. Printed No. 845. Int. 776. Reported. (Same as A. 1119.)

Repealing sections 310 and 311 of the Public Health Law, which require the vaccination of school children. By Mr. Burd. To Public Health Committee. Printed No. 877. Int. 804. Same as A. 864.)

Amending the Insanity Law generally, sections 3, 4, 9, 17, 19, 43, 45, 48, 49, 58, 64, 82, 87, 88, 89, 94, 99, 110, 114, 115, 119, 122, 140, 142, 144, 145, 148, 149, 150, 152, 153, 170, 171 and 172, changing the name of the State Commission in Lunacy to the State Hospital Commission, authorizing hospital superintendents to appoint stewards without approval of the commissioner, providing for commitment to private hospitals for the insane in certain cases, changing the Board of Alienists to the Board of Deportation, abolishing the office of President of the Commission and providing that the three members shall choose their own chairman, and making numerous detailed changes; and repealing section 18 relative to hospital attorneys, and section 123 relative to recovery for support of patients at Matteawan. By Mr. Bayne. To Judiciary Committee. Printed Nos. 898, 1374. Reported. (Same as A. 1095.)

Adding four new sections, 350 to 353, to the Public Health Law, creating a board of examiners consisting of three members appointed by the Governor, one to be a surgeon, one a neurologist and one a practitioner of medicine, each with at least ten years experience, to examine feeble-minded, epileptics, criminal and other defective inmates in State hospitals for the insane, State prisons, reformatories and charitable institutions, and to perform operations to prevent procreation by such persons when in the board's judgment the offspring of such persons would inherit a tendency to crime, insanity, etc. Persons so examined and operated upon are to be represented by counsel. By Mr. McClelland. To Public Health Committee. Printed No. 887. Int. 816. Reported. (Same as A. 1137.)

Adding two new sections, 13-a and 13-b, to the Domestic Relations Law, providing that no license to

marry shall be issued without a physician's certificate that the parties are free from certain diseases, and making it a misdemeanor to procure such certificates, issue them, or issue a license, knowing the statements contained therein to be false. By Mr. Duhamel. To Judiciary Committee. Printed No. 891. Int. 820. Reported.

Amending section 45 of the County Law, relative to acquiring property by condemnation for county tuberculosis hospitals, by providing that after the presentation of the petition prescribed in section 3360 and filing notice as prescribed in section 3381 of the Code of Civil Procedure, the board of supervisors shall become seized of the real estate and may enter upon and occupy the same in the name of the county. By Mr. Walters. To Internal Affairs Committee. Printed Nos. 947, 1216. Int. 838. Passed.

Amending subdivision 5 of section 48, and section 48-a, of the County Law, by providing that county tuberculosis hospitals shall receive any person entitled to admission, and providing that when any indigent patient is admitted as a resident of the county where the hospital is located, and it shall be found that he has not acquired a settlement within the county under the provisions of the Poor Law, the superintendent of the hospital shall collect from the county, city or town in which the patient has a settlement the cost of his maintenance, or may return the patient to the locality where he has a settlement. By Mr. Ferris. To Internal Affairs Committee. Printed No. 918. Int. 872. Passed. (Same as A. 1202.)

Amending sections 271, 272, 273, 277, 278, 279, 280 and 281, of the Public Health Law, by abolishing the board of examiners of the Podic Society and providing for the regulation and licensing of chiropodists by the State Regents on the recommendation of the State Board of Medical Examiners. The license fee is \$25. Moneys received for fees are to be paid into the State treasury. It also provides for registering duly licensed chiropodists in the county clerk's office and makes other provisions. By Mr. Griffin. To Public Health Committee. Printed No. 927. Int. 881. Passed. (Same as A. 828.)

Amending subdivision 2 of section 30 of the Poor Law, relative to indigent persons requiring medical care and treatment, by providing that in Westchester county the charge for such care and treatment, as provided by the section, may be made not to exceed \$2 a day, instead of \$1 a day as at present. By Mr. Wainwright. To Judiciary Committee. Printed No. 978. Int. 891. Passed. (Same as 1258.)

Incorporating the J. H. Dye Medical Institute for the manufacture and sale of medicines, medical preparations, consultations and operating in surgery and prescribing medicines and furnishing care, attendance and home accommodations for invalids. The amount of capital stock is to be \$100,000. The corporation may advertise its medicines, etc. By Mr. Loomis. To Judiciary Committee. Printed No. 1115. Int. 1010. Reported. (Same as A. 1405.)

Amending section 276 of the Village Law by providing that the board of sewer commissioners of a municipality or sewer district may contract for connection of the sewers with the sewers of another village, town or sewer district. By Mr. Ferris. To Villages Committee. Printed No. 1161. Int. 1037. (Same as A. 1270.)

Amending section 121 of the Public Health Law, by authorizing the health officer of the port of New York to sell at public auction any public property connected with the quarantine establishment which he deems useless. By Mr. Cullen. To Public Health Committee. Printed No. 1176. Int. 1052. Passed. (Same as A. 1444.)

Amending section 1571 of the Greater New York Charter by providing that the board of estimate and apportionment may increase the number of coroner's physicians in any borough, and may fix their salary. Appointments to vacancies in the position of coroner's

physician shall be made by the coroners of the borough. By Mr. Sanner. To Cities Committee. Printed Nos. 1220, 1409. Reported amended.

Amending sections 310 and 311, of the Public Health Law, by authorizing school district trustees or boards of education to exclude unvaccinated pupils whenever an epidemic of smallpox exists or is threatened, and striking out the provision that no person not vaccinated shall be admitted into the public schools of the State. By Mr. Gittins. To Public Health Committee. Printed No. 1307. Int. 1136. Reported.

Amending section 3, chapter 787, Laws of 1911, which established a commission to inquire into prices, purity, consumption, etc., of food stuffs in the State, by extending to 1913 the commission's time to make final report to the Legislature, and appropriating \$10,000 for expenses. By Mr. O'Brien. To Finance Committee. Printed No. 1429. Int. 1211.

BOOKS RECEIVED.

Acknowledgement of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

RECENT METHODS IN THE DIAGNOSIS AND TREATMENT OF SYPHILIS. (The Wassermann Reaction and Ehrlich's Salvarsan, "606"). By C. H. Browning, M.D., Lecturer on Bacteriology in the University of Glasgow, and Ivy McKenzie, M.D., Director, Western Asylum's Research Institute, Glasgow. Octavo, 303 pages. Cloth, \$2.50, net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

AN INTRODUCTION TO EXPERIMENTAL PSYCHOLOGY. By Charles S. Myers, M.D., Sc.D. Lecturer in Experimental Psychology in the University of Cambridge. Cambridge: at the University Press. 1912. Price, 40c., net.

HEREDITY IN THE LIGHT OF RECENT RESEARCH. By L. Doncaster, M.A., Fellow of King's College. Cambridge: at the University Press. 1911. Price, 40c., net.

SEX HYGIENE for the Male and What to Say to the Boy. By G. Frank Lydston, M.D. Professor of the Surgical Diseases of the Genito-Urinary Organs and Syphilology, Medical Department State University of Illinois; Member of the American Medical Association; The Society of Authors of London, England; Author of Diseases of Society, The Blood of the Fathers, etc. Illustrated with 24 engravings. Chicago. The Riverton Press. 1912.

SUGGESTION AND PSYCHOTHERAPY. By George W. Jacoby, M.D. Fellow of the New York Academy of Medicine, Member of the American Medical Association, American Neurological Association, and New York Neurological Society, Consulting Neurologist Hospital for Nervous Diseases, German, Beth Israel and Red Cross Hospitals, and The Infirmary for Women and Children in the City of New York, etc. With illustrations. New York. Charles Scribner's Sons. 1912. Price, \$1.50 net.

DEATHS.

F. H. COLTON, M.D., Brooklyn, died March, 1912.

WILLIAM VINCENT DEE, M.D., Brooklyn, died March 18, 1912.

FRANK L. IVES, M.D., New York City, died March 22, 1912.

DAVID LITTLE, M.D., Rochester, died March 1, 1912.

LUDWIG SCHROETER, M.D., Buffalo, died March 18, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

ALGERNON THOMAS BRISTOW, M.D., Editor

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No. 5

EDITORIAL DEPARTMENT

THE OWEN BILL.

THE following resolutions moved by Dr. Le Fevre and duly seconded were unanimously adopted by the House of Delegates at the Albany meeting, April 15, 1912.

WHEREAS, The ever present urgency for a Department of Health at Washington, and the unseemly delay characterizing the efforts to obtain the same, are matters of profound regret to those who have concern for the security of business, and the comfort and safety of the people; and

WHEREAS, The chief magistrates of our country for nearly twenty years have favored the proposition, and also the American Medical Association, the Medical Society of the State of New York, and the medical societies of other States, likewise various learned bodies of patriotic and public spirit kind, have each favored and urged the measure; be it therefore

Resolved, That we, the Delegates of the State Medical Society now in executive session, do earnestly urge and strongly appeal to all good people in behalf of the establishment at Washington of a National Department of Health, and we do pledge our strongest efforts in the use of honorable means in securing the prompt enactment of a law providing for the same.

The amended Owen bill as reported favorably by the Senate Committee on April 13, is intended, as stated in the title, "To establish an Independent Public Health Service and for other purposes." If carried in both houses it will in effect create a National Department of Health, although its chief will not have a seat in the Cabinet.

It is well known to the medical profession that there have been serious objections to an increase

in the number of Cabinet officers. The question is more or less academic at this time since if the end desired is accomplished, it matters little by what name the department be called.

This bill provides for an independent establishment to be known as the United States Public Health Service, under the management of a director of health to be appointed by the President with the advice and consent of the Senate.

There is transferred to said Public Health service the present Health and Marine Hospital service; that portion of the Bureau of Chemistry of the Department of Agriculture charged with the investigation of the adulteration of foods, drugs and liquors and the Division of Vital Statistics from the Department of Commerce and Labor. The purpose of this bill is to coordinate the present public health activities of the United States into one independent service which shall be purely a health service.

Thus states the syllabus attached to the bill by the Committee.

This bill has been strenuously opposed by a motley crew who march under the banner of the League of Medical Freedom; a league banded together for the purpose of exploiting the public to their own ends and of filling their own coffers at the expense of a credulous and easily deceived common people.

The Owen bill, if passed, will do much to curtail liberties of this sort. Accordingly the League for Medical Freedom has industriously circulated all sorts of false reports concerning the bill. Among other erroneous statements has been the palpable lie that the medical liberties of the people are in danger and that the American Medical Association is a Medical Trust formed for the purpose of corraling all the medical activities of the nation.

So the league of the quack medicine men and the food adulterators dubbed itself the League for Medical Freedom and started out to fool the people. Some of the League's dupes and accomplices have been writing piteous appeals to their senators to be saved from the jaws of the American Medical Association. A sample wail is the following, which we take from the *Journal of the American Medical Association*:

"Vote in favor of the Owen bill means the establishment of one of the worst trusts in our country; its defeat means that we can still choose our own physician and our own medical school. We don't want any interference with our present vested rights of freedom.
W. ELWANGA."

In Section 3 of the Owen bill occurs the following clause:

And provided further, That the Health Service established by this act shall have no power to regulate the practice of medicine or the practice of healing, or to interfere with the right of a citizen to employ the practitioner of his choice, and all appointments within the Health Service, including the head of the service, shall be made without discrimination in favor of or against any school of medicine or of healing.

In view of this plain provision of the bill expressly designed to protect the "vested rights of freedom," it will be seen that the enemies of the bill are forced to plain downright lying in their efforts to prevent its passage.

The senator from the State of Washington who read this precious production stated that he had received many protests against the bill but no word in its favor. Let it be impossible for the representatives of the State of New York to make a similar statement. Every medical man who has the interests of the common people at heart and who is opposed to successful quackery and fraudulent drugs and foods will distinctly aid in the passage of this bill by writing to Senator Owen at Washington and expressing himself as strongly in favor of the bill which is in the interest of economy, efficient administration and liberty, but not license.

SPECIAL LICENSE FOR THE SPECIALIST.

A WRITER in a recent number of the *Journal of the American Medical Association* raises his voice in lamentation because the state has not taken over the control of the practice of the specialties.

"Any person who chooses to call himself a specialist may do so," he wails. This he proceeds to demonstrate is anarchy with a large A. "Anarchy is the absence of government, a state of lawlessness. It is scarcely necessary to be reminded that there is an almost anarchistic state of affairs in regard to the practice of medicine."

"A number of physicians have undertaken obligations distinctly different from the general duties of the profession. This specialization requires special preparation and we are confronted with the question to what extent the supervision of the state is applied to the practice of specialties. The answer is as simple as it is dumbfounding. It is evident that a State Board of Medical Licensure must exercise this control not only in name but in fact."

Such are the Lamentations of Jeremiah. The wicked specialist has been splitting fees for which he is being roundly and properly scolded in every direction. And now from the West comes further woes for the unfortunate specialist. It is not enough that the state regulates the broad practice of medicine as at present. Our new critic is not satisfied with one King Stork but wants several. We have regulated the "regulars." We have regulated the homeopaths. We have regulated the eclectics. We have regulated the osteopaths and the optometrists, also the plumbers, the chauffeurs and the chiroprudists.

Let us have a few more boards. Let us have a Board of Examiners for Diseases of the Ear; a Board of Examiners for Diseases of the Eye, a Board of Examiners for Diseases of the Throat and Nose; a Board of Examiners for the Diseases of Women; a Board of Examiners for Diseases of the Skin; A Board of Examiners for the Diseases of the Genito-Urinary Organs; a Board of Examiners for Nervous Diseases; a Board of Examiners for Diseases requiring Orthopedic Treatment. This would only make eight new boards of examiners to be added to the present board.

We quite agree with the writer that his remedy is dumbfounding. It is absolutely stupefying.

Such an absurd proposition is based on the notion that a specialist may be turned out of medical school and hospital, armed *cap a pie*, a sort of young Lochinvar come out of the West to conquer at sight.

If we are going to have state boards of examiners on all the specialties such a course would imply the right of the specialist to announce himself as such. Naturally a specialist would need to have a general license to practice medicine besides the special license, otherwise he would have to call in a general practitioner to treat a case in which he had operated, but which had developed pneumonia. So also the otologist could not treat complicating adenoids unless he was licensed also as a nose and throat specialist. What would be done to the general surgeon who operating for appendicitis discovers instead a pair of pus tubes? Such sad accidents have happened to the best intentioned men. It would be dreadful for a man to take out a pair of pus tubes when he was only licensed for appendicitis. And what of the general practitioner? A young woman comes to his office with a leucorrhœa. He ventures, not having the fear of the law in his heart, to treat her and cure her. Other cases of diseases in women come to him naturally as a family practitioner. He treats them with success and suddenly finds himself possessed of special skill which he has acquired in the practice of his profession. Is he now a specialist? What constitutes a specialist? The ethics of the profession have always prohibited any announcement of a specialty. In New York a man cannot put "Oculist" on his sign, without incurring discipline.

What then is to constitute the specialist? A man cannot graduate from a medical school as a specialist. "Oh, but he ought to," says our writer. The course in all medical schools is four years. At the end of this long period the young man has a general knowledge of most medical topics, a particular and special acquaintance with none. Most men after graduation and a year or two in a hospital are compelled by the exigencies of life to take what comes to hand and glad to get it. The specialist is a growth of after years and the

experience of general medicine through which most specialists have passed is invaluable. Without it a specialist would be a narrow-minded worker in a narrow field, often misinterpreting symptoms and fitting them to his own particular specialty.

It does seem as if the experience through which the profession is passing in the various states in the application of state regulation ought to be enlightening. We have passed from the reign of King Log to the reign of King Stork. If we have much more state regulation, we are likely to be regulated out of existence as a profession. We may well exclaim prayerfully, "From our well-intentioned friends, good Lord deliver us."

THE PREVENTION OF BLINDNESS.

THE third annual report of the Committee on Prevention of Blindness of the New York Association for the Blind contains much valuable information for the legislature and the medical profession. Perhaps the most striking fact presented in this report is that half the births in New York State are attended by midwives. The report goes on to say that for the most part these women are untrained or ill trained and grossly ignorant and careless of prophylactic methods. The report adds the very natural conclusion that serious consideration must be given to the improvement of their training and practice.

When we reflect on a further statement made in the report that 25 per cent. of all cases of blindness in schools for the blind are the result of ophthalmia neonatorum we are forced to the conclusion that no matter what may be the effect on the medical profession, we must establish some better system of regulation and education of midwives than at present prevails. Half the entire population of the State of New York is in New York City and the practice of midwives is for the most part confined to the poorer classes in the large cities. These people are too poor to pay for the services of a doctor and a nurse.

There are usually other children to be cared for during the illness and disability of the mother. The midwife fulfills the function of

both nurse and doctor and consequently gets the preference over the doctor for economic reasons which we cannot alter. It is perfectly evident, therefore, that the State of New York with the aid of the medical profession ought to undertake the education of these women so that at least they should be reasonably clean in their work and with respect to ophthalmia neonatorum be able to recognize it as a disease dangerous to vision and report it. We are not in favor of making poor doctors of them without a medical degree, as the state has done under misguidance in the case of nurses, but they ought to have a simple practical course which would secure reasonable asepsis and a prompt recognition of the accidents of labor requiring the intervention of a physician and the methods of prophylaxis against gonorrhœal ophthalmia, with a recognition of its dangers and the knowledge that failure to report redness and swelling of the eyes in the newborn occurring within two weeks after birth means fine and imprisonment or the revocation of their license to practice midwifery. The report states that in Boston as a result of publicity given to *convictions for neglect* the number of cases of ophthalmia neonatorum rose from ten in the month before the first conviction to one hundred and sixty eight months later.

The Boston follow-up system has also been accompanied by admirable results. Here after the diagnosis has been made by the medical inspector the treatment is carried out by a visiting nurse employed by the city.

To this system no objection can be made for the nurse is fulfilling her proper functions, the carrying out of treatment.

After all such methods of treating what is essentially a venereal disease, follow the time honored practice of locking the stable door after the horse is stolen. Under the heading "Must be Normal and Well to Wed," the *New York Times*, March 25, publishes the plan of Dean Sumner, of Chicago, who has announced that beginning with Easter "No persons will be married at the cathedral of Sts. Peter and Paul unless they present a certificate of health from a reputable physician to the effect that they are normal physically and mentally and *have neither an incurable nor communicable disease.*"

It is not to the credit of the medical profession that so important and necessary a reform should take its initiative from the clergy. The responsibility of the people's health rests with the medical profession and we have been too much occupied with the cure of venereal disease, too little with its prevention. True we have a society for Moral Prophylaxis, but it is a physical prophylaxis which we need and while education can do much, our most practicable line of defense for the present should be in front of the marriage altar. We think that Dean Sumner goes too far when he requires a certificate of mental and moral fitness. What is to be the standard of moral fitness? What of mental fitness? To what extent have we a right to interfere with individual freedom along such shadowy lines as these? We have, however, a clear right to prevent the infection of an innocent woman with gonorrhœa or syphilis. Here are perfectly definite conditions, which ought to be absolute bars to marriage. It ought, however, to be the prerogative of the state, by incorporating in the law the needful restrictions to do legally what a brave and well meaning and intelligent clergyman is doing outside the law. His effort to bring about reform can be active and effective only so far as it concerns his own parish. Persons who cannot comply with his conditions will go to some other parish for the marriage ceremony. The moral effect of Dean Sumner's announcement ought to be great. It ought to arouse the medical profession to its duty. It ought to unite both theology and medicine in an earnest endeavor to reform our marriage laws so that individuals with venereal diseases should be deprived of the power to infect the innocent.

Such a law would do more to prevent blindness from ophthalmia neonatorum than all the *Credè instillationo* which have ever been practiced. It is doubtless laudable to cure disease. It is still better to prevent it altogether. Ophthalmia neonatorum is a preventable disease. Its existence is a blot on the legislature and a blot on the medical profession.

The clergy, or one clergyman at least, is teaching both the lawyers and the doctors a much needed lesson.

Original Articles

ANIMAL EXPERIMENTATION AND ITS BENEFITS TO MANKIND.*

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NOTE.—In this paper is summarized evidence which has been presented in detail in pamphlets published by the Bureau for the Protection of Medical Research of the American Medical Association of which the author has been chairman. These pamphlets, written by experts in the several fields, are referred to in the present paper, and should be consulted by persons desiring further information.

TWO ways are open to us for obtaining a knowledge of nature: we may merely watch natural events as they occur, or we may arrange conditions so that the events will appear or disappear, or be modified, as we may wish. For example, the growth of wheat we may study carefully in different native surroundings, or we may place the wheat where we can at will examine the effect upon it of heat and cold, sunlight and darkness, wind, gravity, drought, and the chemicals of the soil, as these various agencies affect its growth and productiveness. The former method is purely observational, the latter is experimental. The experimental method in which the conditions to be observed are under control, is, in the main, the distinguishing procedure of modern science.

There is nothing mysterious about experimentation. The method implies first that study of natural events suggests certain explanations for their occurrence, as, for example, that lime in the soil or high temperature, makes hard wheat, and that the cautious person, instead of immediately accepting suggested explanations as true, prefers to put them to test.

Of the two methods of learning about nature, the experimental has proved more fruitful than the purely observational, chiefly, I think, because experimentation is concerned with means of controlling natural forces. The different sciences, however, are subject to the application of the experimental method in different degrees. Most subject to it are chemistry and physics, since of all the natural sciences they are most simple. As a result of the employment of experimentation astounding advances have been made during the past hundred years in chemistry and physics, and in their industrial applications. All about us are innumerable instances of the practical benefits that have flowed from the experimental study of nature in its physical and chemical aspects. I need mention only the telephone, the telegraph and wireless telegraphy, steam and gas and electric engines, to indicate how prodigious have been the transformations in civilized society wrought by practical utilization of the scientific discoveries.

There are other sciences, however, that do not

lend themselves so readily to investigation by experiment. In consequence our understanding of them is still very defective. Some phases of geology, for example, fall into this class. It has been pointed out that we today know little more about the mechanism of the volcano than Pliny when he watched the eruption of Vesuvius that destroyed Pompeii. We cannot control the conditions of volcanic action experimentally, and therefore have only the simple observational method to apply.

In medicine also the growth of our knowledge was similarly limited, until about the middle of the last century. Up to that time disease had been studied mainly by observation of sick people. To account for sickness all sorts of theories were advanced, such as bad air, the influence of stars, and mysterious humors and miasms; but these theories were subjected to almost no experimental test. Of course, the highly complex character of living creatures made the beginnings of experimental medicine difficult, for not only do living beings exist together in very complicated biological relations, but each one is an extremely complicated structure, with obscure processes going on within it. In spite of these difficulties, however, the experimental method began about 1850 to be applied systematically to the study of disease, and during the sixty odd years since then all manner of medical and surgical problems have been experimentally investigated. What has been the result? According to Osler the experimental study of physiology and pathology during the second half of the last century did more to emancipate medicine from the routine and thralldom of tradition than all the work of all the physicians from the days of Hippocrates (460 B. C.) to Jenner (1749-1823).

In that marvellous period of transformation of medical knowledge and practice the most fundamental discovery was that of the relation between micro-organisms and disease. Pasteur, whose name will be forever linked with this discovery, was a chemist who became interested in conditions which produce bad taste in wines. In the "diseased" wines, as they were called, he found unusual micro-organisms. "Did they occasion the bad taste?" he asked. To test this idea, it was only necessary to introduce some of these minute plant growths or germs into good wines. This he did, whereupon these wines also were rendered distasteful, and thus Pasteur's idea was substantiated. Later, when his attention was called to a disease in silk worms, he again found micro-organisms present and thought that here also they might be the source of the trouble. Applying, as before, the test of experiment, he introduced the micro-organisms into healthy silk worms and succeeded in reproducing in them the same disturbance. In this case the disease was no less certainly the product of the germ than the oak is the product of the acorn. The idea that all infectious diseases result from these

* Read at the Annual Meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

microscopic invaders was a natural and logical next step. Thus originated the bacterial theory of infection.

This theory was soon tested experimentally by many investigators, who studied not only afflictions of the lower animals, but those of man as well. And by the numerous proofs that were accumulated, the theory became so firmly established that we now no longer speak of the bacterial "theory" but of the bacterial or parasitic origin of infectious diseases.

The study of diseases which we recognize in human beings is of special interest. First in importance among these, perhaps, is tuberculosis. Klencke (1843) and Villemin (1865) had shown that "tubercle" was infectious by injecting into rabbits tuberculous tissue and sputum and thus inducing the disease, but its real nature was not clear until Koch in 1882 announced the discovery of the germ always found with the disease, the tubercle bacillus. The proof that this germ is the cause of tuberculosis Koch obtained entirely by carefully controlled experiments on animals. He separated the bacteria from tuberculous tissues, made the bacteria grow "pure" outside the body, injected these pure cultures into healthy animals, thereby causing tuberculosis, and then recovered from their diseased tissues bacteria in all respects like the original. Conclusive proof was thus given that tuberculosis results from growth of the tubercle bacillus. All the preventive measures in our great modern campaign against the White Plague are the outcome of these and other experiments on animals. The signs in the street cars warning against spitting are there because animal tests proved that tuberculous sputum is infectious.

Twenty-six years ago Trudeau observed that rabbits inoculated with tuberculosis recovered if kept in the open air and supplied with abundant food, whereas other rabbits similarly inoculated and placed in unfavorable conditions of light, air, and food succumbed to the disease. By these observations belief in the value of dietetic and open-air treatment was confirmed; and the further demonstration of the efficacy of such care of human beings afflicted with tuberculosis has led to its universal adoption.

What have been the results of these researches on animals? From them we learned that tuberculosis is not inherited, that it is communicable and therefore preventable, and that in its earlier stages it is curable. In most countries the death rate from pulmonary tuberculosis has been steadily declining. In Boston, where for twenty years before 1882 (when the tubercle bacillus was discovered) the death rate had been about 42 per 10,000, it fell in the subsequent twenty years to 21 per 10,000. It has since fallen to less than 18 per 10,000. That decrease has meant a saving of thousands and thousands of human lives in the city of Boston alone. Throughout the civilized

world the reduction of mortality has been incalculably great.

The alternative to these happy results has been clearly stated by Trudeau: "If it were not for the knowledge which science has won by animal experimentation in the field of this disease in the last twenty-five years, we should still be plunged in the apathy of ignorance and despair toward it, and tuberculosis would still be exacting its pitiless toll unheeded and unhindered."¹

Another disease which has brought torment and great disaster to man is the bubonic plague. Any one who has read of visitations of this horrifying pestilence knows how mysteriously and how swiftly death spreads among large populations, and with what awful terror it was regarded. De Foe, in his "Journal of the Plague Year" in London, tells how the streets became hushed as the infection spread insidiously from parish to parish, how the carts moved about at night receiving the heaped bodies of the dead, and how the bodies were dumped pell-mell and by hundreds into huge pits dug for their burial. Thousands died week after week in the city. In the presence of such tragedy the fright and apprehension of the people caused homes to be abandoned, friends to flee from friends; and when the disease developed, the desperate victims often sought death by suicide or became insane. "People in the rage of the distemper," wrote De Foe, "or in the torment of their swellings, which was indeed intolerable, running out of their own government, raving and distracted and oftentimes laying violent hands upon themselves, throwing themselves out of windows, shooting themselves, mothers murdering their own children in their lunacy," such was the plague in London in 1665, and such it has been in the great populations of the Orient in which it has so often raged.²

The mystery of this frightful scourge was lifted when in 1894 Yersin and Kitasato discovered the germ (*bacillus pestis*) which invariably accompanies the disease, and when later Simond and others showed, by experiments on animals, that it was spread among rats by fleas, and could be transferred by these same insects from rats to monkeys. The rat flea also feeds upon man when its natural prey is not available. Thus was established the biological complex by which plague becomes infectious. The attitude of the entire medical world towards the plague was changed by these discoveries, for they suggested a definite program for checking or even abruptly stopping an epidemic.³ In former times, when physicians were baffled, the people in their fear resorted to "fortune-tellers, cunning men, and astrologers," or placed their faith in "antipestilen-

¹ Trudeau: A.M.A. Pamphlets, Animal Experimentation and Tuberculosis, 1909.

² In India alone in the one year 1905, the number of recorded deaths from plague was 1,040,429.

³ See McCoy: A.M.A. Pamphlets, The Relation of Animal Experimentation to our Knowledge of the Plague, 1910.

tial pills" and "royal antidotes." What futile weapons to combat fleas and rats! Now traps are set, rookeries and vermin-breeding hovels are torn down, and victims already infected are isolated so that they shall not be the cause of further infection. Through such measures, where it has been possible to apply them, seriously threatening epidemics of plague have been promptly stopped, and the terror of Black Death has been largely abolished. To experiments on rats, guinea pigs and monkeys we are indebted for this deliverance.

Another disease in which marvelous benefits to human beings have been secured through animal experimentation is diphtheria. The peculiar bacteria of this disease, noted by Klebs in 1883, were separated in pure culture by Loeffler, and were inoculated into guinea pigs and rabbits. The characteristic whitish, tough membrane formed at the seat of inoculation. Since the bacteria were found not at all scattered through the body, but only where the membrane joined the living tissues, the conclusion was drawn that death of the animals was probably due to a poison or toxin produced by the bacteria and spread through the system by the circulating blood. These experiments on animals established for all time the rôle of the diphtheria bacillus and its toxin in producing diphtheria.

An even more practical discovery in connection with this disease was that of the mechanism of immunity. In 1888 Roux and Yersin found that if bouillon in which diphtheria bacilli have been growing is filtered and injected into guinea pigs, it is highly poisonous in very small doses. The inference that diphtheria germs kill by producing a soluble poison or toxin was thus confirmed. Two years later von Behring and Kitasato, by injecting first small, then increasing doses of the toxin into goats, discovered that the animals became adapted or immune to the poison, and further that the immunity depended on an antidote or antitoxin contained in the blood. And still more important and surprising, they found that blood taken from an immune animal and injected into normal animals would protect these animals against fatal doses of the toxin, or would even cure animals that had shortly before received the fatal dose. If the toxin was mixed with some of the protective blood or serum outside the body, the poison was completely neutralized; and the mixture of toxin and antitoxin, when injected, had no harmful effect whatever.⁴

It is sometimes said by opponents of animal experimentation that the injection of "diseased blood" of an animal into our bodies is loathsome. This feeling, however, indicates an entire misunderstanding of the natural processes by which our bodies are protected against bacterial poison.

Our bodies, when we successfully resist a disease like diphtheria, are protected by the development of antitoxin within us, precisely as the bodies of these laboratory animals were protected against increasing doses of toxin. And when we use antitoxin in treating diphtheria we merely take from the blood of a horse, which has been rendered immune by injected toxin, some of the protective substance which the animal has developed, and apply it to increase the protective substance which our own bodies are producing in the fight against the disease.

What has been the practical outcome of these experimental studies of diphtheria? Dr. Park of the New York City Board of Health has shown that in 1893 the death rate from diphtheria in nineteen large cities of the world was slightly over 80 per 100,000 population; in 1895, when the antitoxin treatment was introduced, the rate began to drop in almost all the cities; and in 1907 the rate had fallen from the 80 per 100,000 of 1895 to 17 per 100,000. That this extraordinary change has come gradually is explained by the facts that antitoxin was not at once universally employed, that the value of large doses was not at first recognized, and that the supreme importance of early treatment was not immediately demonstrated. Numerous experiments have shown the marvellous effects of instant injection as soon as the disease appears. In the New York City Hospital for Contagious Diseases, 218 cases treated on the first day had no deaths.⁵ In the Boston City Hospital there have been during the past sixteen years, among nurses, physicians, and attendants in the contagious wards, 431 cases of diphtheria. All these persons have received instant treatment; there has not been a single death. The figures that have been gathered are on so large a scale, and are so striking and so precise, that it is impossible to misunderstand them. They prove definitely that the antitoxin treatment has saved from death scores of thousands of human beings.

Death from diphtheria was formerly one of the most frightful modes of death, for the growing membrane led to literal strangulation. Here is Trousseau's description of the disease in a little child. It was written about 1870. "The difficulty of respiration increases in severity. Every hour, or every two or three hours, a suffocative fit comes on. The suffocative attacks follow one another more rapidly, and become more and more violent. From time to time the infant, in a state of excitement which it is impossible to describe, suddenly sits up, seizes the bed curtains and tears them with convulsive frenzy; he throws himself on the neck of his mother or of those about him, embracing them and trying to clutch whatever he can as a something to hold by. At other times it is against himself that he

⁴ A large body of knowledge, the science of immunology, has been built on these and other experiments on the resistance of organisms to infection. See Gay: A.M.A. Pamphlets, Immunology, a Medical Science developed through Animal Experimentation, 1910.

⁵ See Park: A.M.A. Pamphlets, The Rôle of Animal Experimentation in the Discoveries leading to our Present Knowledge of the Etiology, Prevention and Cure of Diphtheria, 1911.

directs his impotent efforts, grasping violently the front of his neck, as if to tear out from it that which is suffocating him. The puffy, purple face, and the haggard, sparkling eyes express the most painful anxiety and the most profound terror; the exhausted child then falls into a sort of stupor, during which respiration is difficult and hissing. The face and lips are pale, and the eyes sunken. At last, after a supreme effort to breathe, the agonies of death begin, and the struggle ends.⁶ With such distressing scenes in hospitals in which diphtheria cases were received can we wonder that it was difficult to secure nurses who would remain!

The introduction of antitoxin not only reduced the death rate in the remarkable manner already mentioned, but greatly relieved the distress of the afflicted. The injection of the curative serum soon causes the membrane to roll up, and to be so quickly removed that in most cases the danger of suffocation does not arise. At the meeting of the American Pediatric Society in 1896, when the first experiences with the new treatment were being reported physicians spoke of the "marvellous" effects they had witnessed, and declared that in years of practice they had never known such surprising results as antitoxin had made possible.⁷

Cerebrospinal meningitis is another disease which has claimed its victims by the scores in epidemics which from time to time have swept through our communities. Its mysterious onset and its dreadful power to kill and mutilate spread consternation whenever it appeared, for the physician was helpless in its presence. About 75 of every 100 cases ended in death, and the 25 who survived were often left blind, deaf, paralyzed, or imbecile.

The germ causing this disease was discovered by Weichselbaum in 1887, but it was not until twenty years later, in 1906-7, that Flexner developed an effective treatment. This consisted in producing in the horse an antiserum, in a manner similar to that used for diphtheria antitoxin. The antimeningitis serum was first carefully tested by injecting it into the spinal canal of monkeys previously infected with cerebrospinal meningitis, with the result that the serum quickly restored the animals to health. About twenty-five monkeys were used in the course of the investigation.

Already in nearly a thousand cases of cerebrospinal meningitis⁸ the death rate has been reduced from approximately 75 per cent. to about 25 per cent. in the cases treated during the first days of the illness. And even when cases treated late are included, the mortality is only slightly over 30 per cent.

⁶ Trousseau: Lectures on Clinical Medicine. Translated by Rose and Bazire, Vol. i, pp. 342-344.

⁷ See Boston Medical and Surgical Journal, 1896, cxxxv, p. 13.

⁸ This form of meningitis should not be confused with other forms; health board statistics often do not differentiate the various types.

The reduction of mortality, however, is not the only benefit. The curative serum greatly shortens the duration of the disease, and, what is more important, the patient usually recovers without the deafness and blindness and paralysis, and the impairment of mental power so often the consequence in untreated cases. Dunn has contrasted the appearance of the wards of the Children's Hospital, Boston, now as compared with the pre-serum days. "Formerly," he writes, "there were almost always to be seen wasted little patients lying with head drawn back, neck rigid, limbs twisted and paralyzed, head swollen by hydrocephalus, and other painful conditions, and remaining thus for weeks or months until death resulted. Now the little meningitis patients are soon laughing, talking, and playing with other children, and need not be kept long in the hospital."⁹ Surely this direct result of animal experimentation, that has already been manifested in the saving for useful lives a half-thousand human beings, it to be counted among America's choicest contributions to the "relief of man's estate."

One of the earliest interests of investigators engaged in experimental medicine was the study of the nature of pus, and of blood poisoning. Pus had been regarded as so necessary for the healing of wounds that its appearance was watched for, and it was designated "laudable pus." Yet accompanying it were much distress and pain and a very high mortality. In our Civil War blood poisoning (*pyemia*) was not infrequent, and had a mortality of over 97 per cent. Fifty-one per cent. of the men who had the knee joint opened died of infection, and of those who suffered a fracture with rupture of the skin about 66 per cent. died. The abdomen and other body cavities were forbidden fields for surgical interference because death so certainly followed the operation of opening them.

Careful microscopic inspection revealed the presence in pus of numerous bacteria. Might not the bacteria cause the pus? If they were excluded might not wounds heal without becoming purulent? Working on this suggestion and on ideas that Pasteur had expressed, Lister watched the healing of surgical wounds in men, and experimental wounds in lower animals, when access of germs to the wounds was prevented by carbolic acid sprays and dressings. The wounds healed without pus! Later it was found that carbolic acid could be dispensed with, and that soaping and scrubbing the skin, and steam-sterilizing instruments and bandages were sufficient precautions against purulent infection; but nevertheless Lister's studies were the beginning of modern aseptic technique. All the astonishing advances in surgery during the past forty years have been made possible through these studies, which were inspired by the results of Pasteur's experiments

⁹ Dunn: A.M.A. Pamphlets, Animal Experimentation in Relation to Epidemic Cerebrospinal Meningitis, 1911.

on animals and in which animal experimentation played a highly important rôle.¹⁰

Not only in the development of surgical asepsis, but also in the development of surgical operations have animals been useful to man. The surgeon knows where to approach the brain because the parts of the brain associated with different bodily activities have been discovered through physiological experiments on monkeys. The restoration of cut nerves and the proper method of suturing them have been learned through a series of physiological experiments. Many successful operations in the abdominal cavity have resulted directly from tests previously made on animals. The possibility of excising without danger a large extent of the small intestine was thus first demonstrated. Various means of making an artificial opening between the stomach and intestine were also experimentally devised. Proper methods of joining the ends of the severed bowel likewise were first shown on animals. More recently by animal experimentation the surgery of the chest has been developed; and now apparatus has been invented which permits operations on the heart, the lungs, and other structures of the chest cavity, without the disturbing and possibly serious collapse of the lungs—formerly a constant danger when the thorax was opened. And still more recently, through operations on animals the surgery of blood vessels has been perfected to such a degree that dangerous hemorrhage may be readily treated by the transfusion of blood from a friend or relative to the person in need. These are merely illustrations of the immense advances in surgery in the past thirty or forty years which have sprung directly from experimental methods applied to surgical problems. The release of mankind from distress, disability and long-lasting pain, which has been the consequence of these advances, is beyond all calculation.

Similar to the infection of surgical wounds was child-bed fever. Gordon (1792), Oliver Wendell Holmes (1843), and Semmelweis (1847), had urged that this curse of motherhood was contagious and borne from patient to patient by the attending doctor, but little attention was paid to these claims until Pasteur cultivated the bacterium (*streptococcus*) from puerperal infection, and by experiments on rabbits demonstrated its power to produce blood poisoning. The enormous mortality in the maternity hospitals before child-bed fever began to be treated as a disease of bacterial origin is not now well remembered. Not infrequently in former times these hospitals were regarded as the very portals of death. In all countries the death rate ranged between two and seven per cent. and at times rose to 14, 20 and once, in the Maternité in Paris, to the appalling height of 57 per cent. In the

sixty years ending with 1875, 363,624 women had died of puerperal fever in Prussia alone. Puerperal epidemics were said to be to women what war is to man. "Like war they destroy the most healthy, the bravest and the most useful portion of the population; like war they take subjects in the flower of their age and spread terror and desolation throughout the territory which they devastate." These sentences were written in 1870.

In 1879, at a memorable meeting of the Academy of Medicine in Paris, the writer of the above sentences was explaining death from puerperal fever as due to atmospheric influences, overcrowding, the tainted air of old wards, or the power of mind over body, and had expressed his disdain for bacterial contagion by predicting that he expected to be long dead before the specific bacterium was discovered, when Pasteur arose, seized a piece of chalk, and drew on the blackboard outlines of the streptococcus. "There!" he exclaimed, "that is the shape of it!"

By use of asepsis, proved effective in preventing wound infection, the mortality from child-bed fever in hospitals has fallen to the neighborhood of one-tenth of one per cent.—which means an immeasurable reduction of human misery, and the preservation of numberless lives at a time of supreme importance to family and racial welfare.¹¹

Mankind has benefited from animals not only in learning the bacterial transmission of various diseases and in the improvement of surgical technique, but also in the discovery of useful drugs. Indeed the whole modern science of drug-action is founded on animal experimentation. Consider for a moment what blessings have come from such investigations. All the drugs producing sleep, which have been discovered during the past forty years, have been discovered by experiments on animals. All the local anæsthetics, as cocaine, for example, rendering small surgical operations painless, have been discovered by experiments on animals. The only drug which will give prompt relief from the distress of *angina pectoris* is amyl nitrite—a drug which was discovered during experimentation on animals. All modern drugs for reducing fever; the cardiac tonic, strophanthus; the diuretics, caffeine and theobromine; the emetic, apomorphine,—were all introduced through experiments on animals. These do not by any means exhaust the list of medicaments discovered by the experimental method applied in pharmacology. Nor do they indicate all the uses of the method in that new science. Through tests on animals, some drugs whose worth was known have had their action more precisely defined; digitalis, for instance, is one of these. Others have been proved harmful; and still others have had their activity standardized. One of the most interesting examples of

¹⁰ See Keen: A.M.A. Pamphlets, Modern Antiseptic Surgery, and the Rôle of Experiment in its Discovery and Development, 1910.

¹¹ See Williams: A.M.A. Pamphlets, Obstetrics and Animal Experimentation, 1911.

the use of animals to test the efficacy of drugs is that of ergot—a drug employed to stop hemorrhage, particularly the dangerous hemorrhage that sometimes follows child-birth. Ergot can thus be tested on an animal and proved potent before being placed in the hands of a physician, or it can be tested for the first time on a woman who is bleeding to death—the choice has to be made.

A most thrilling recent development in the study of drug action is the discovery by Ehrlich that through extensive selection chemicals can be found which act like antitoxin in affecting specifically the invading germs, with little or no injury to the patient. This discovery has been utilized especially in the treatment of one of the most calamitous and ravaging of diseases, syphilis. In 1903, experimentation with this disease was made possible by Metchnikoff and Roux who learned that it could be transmitted to monkeys. Later Schaudinn and Hoffmann found the micro-organism of the disease; and soon its presence in inoculated animals was demonstrated. At almost the same time, by means of animal experiments, a biological test, the "Wassermann reaction," was devised, which, when positive, proves the existence of the disease, even in the absence of other signs or symptoms. The value of this test in cases of doubtful diagnosis, or in latent syphilis, is incalculable. All this experimentation prepared the way for Ehrlich's triumph. After the manufacture and trial of hundreds of substances, Ehrlich found one, number 606 in the series, now known as salvarsan, which, when injected into a syphilitic rabbit, caused the micro-organisms entirely to disappear, and without injury to the rabbit. Then the drug was tested on dogs, without injury. Then two laboratory assistants volunteered to demonstrate the safety of injecting human beings. Only after this was the drug tried on patients. That was hardly two years ago. Even if the final judgment regarding salvarsan sets limits to the first hopes, nevertheless the astonishing results that have already been achieved prove that Ehrlich's experiments on rabbits have added an agency of greatest importance in treating this ancient scourge of social life.¹²

Prominent among the services of animal experimentation is that of helping in the diagnosis of disease. The *early* diagnosis of infectious disease is essential both for the treatment of individuals and for the prevention of epidemics. We depend on animal tests for determining many of the most serious, socially dangerous afflictions. In tuberculosis, for example, hope lies in early recognition of the nature of the illness. In the first stages the few tubercle bacilli in the sputum may not be observed under the microscope, yet the same material injected into a guinea pig will

clearly demonstrate their presence. * * * Cultures of the typhoid bacillus, injected into animals, will induce in the blood power to cause typhoid bacilli, and typhoid bacilli alone, to gather in clumps. Thus the blood of these injected animals can be used to detect the presence of typhoid bacilli in suspected persons as, for example, the apparently normal bacillus-carriers, who are such a menace to public health. * * * Cholera-carriers, and persons afflicted with cholera in mild form, can be discovered by the same method. Indeed, the protection of a country from invasion by cholera involves measures in which diagnosis by animal tests is a very important procedure. When we consider that in a single epidemic many thousands have died, and that widespread disturbances of commerce and industry have resulted, we can understand the essential value of finding and controlling the first cases. * * * In the diagnosis of plague, and to a more or less degree in the diagnosis of dysentery, Malta fever, anthrax, glanders, actinomycosis and other micro-parasitic diseases, animal tests often play an essential rôle.¹³ More and more we are depending on prevention rather than cure to reduce mortality. Without the means of early and correct recognition of the infectious diseases which animal tests have largely provided, the sanitarians, who stand as sentinels in our great cities and along our coasts, would be deprived of their weapons of defense, and be rendered useless as protectors of the public health.

The first of the medical sciences to use experimental methods was physiology—the science of the normal working of organs. The abnormal working of organs in disease is necessarily measured by the normal standard which physiological investigation has revealed. Take away from physiological knowledge that which is based on animal experimentation and almost nothing would be left! Probably no system in the body more frequently requires earnest study by the physician than the circulatory system. As Erlanger has shown, with much thoroughness, practically all that we know of the course of events in the heart, the proper interpretation of the cardiac sounds, the factors determining blood pressure, the nervous control of heart and arteries, the intelligent treatment of cardiovascular disease—all have resulted from studies on animals.¹⁴ What is true of the circulation is true also of digestion. Through the activities of a succession of investigators, who experimented on animals, we now know the changes which food undergoes in each portion of the alimentary canal, the nature of the digestive juices, the conditions under which they are poured out, and, to a large

¹² For further statement, see Churchman: A.M.A. Pamphlets, *The Value of Animal Experimentation as Illustrated by Recent Advances in the Study of Syphilis*, 1911.

¹³ See Rosenau: A.M.A. Pamphlets, *The Rôle of Animal Experimentation in the Diagnosis of Disease*, 1909. Also Richardson, A.M.A. Pamphlets, *The Importance of Animal Experimentation in the Development of our Knowledge of Dysentery, Cholera and Typhoid Fever*, 1910.

¹⁴ See Erlanger: A.M.A. Pamphlets, *Animal Experimentation in Relation to Practical Knowledge of the Circulation*, 1910.

degree, the causes and character of digestive disorders. Similarly we are now securing, through the brilliant researches of Sherrington and others, illuminating insight into some of the intricacies of the nervous system. These and many other notable contributions to physiology, which almost daily stir our wonder at the marvellous organization of the body, are the direct outcome of operations on animals. It cannot be too strongly emphasized that almost the entire structure of physiological knowledge on which the modern physician bases his judgment—knowledge which in practice makes all the difference between understanding and blind bewilderment—has grown from the application of the experimental method.

Physiology in co-operation with clinical medicine has also contributed directly to the cure of human diseases. The distressing malady known as cretinism, is due to absence of the thyroid gland from birth. Formerly cretins spent their lives as imbeciles, stunted in stature and hideous in appearance. The semi-bestial aspect, blubber-lips, turned-up nose sunken at the root, wide-open mouth, lolling tongue, small eyes with swollen lids half closed, the stolid expression of the face, the muddy dry skin—all combined to make a monstrous creature. The physiological experiments of Schiff showed that implantation of the thyroid gland in the body would prevent the changes caused by extirpation. Then it was discovered that feeding the gland or injecting the gland extract is as good as implantation. And now absence of the thyroid can be compensated for by administering by mouth thyroids or tablets which contain the essential substance, derived from lower animals. The transformation that occurs in the cretinous idiots, when treated early, is nothing short of miraculous. As Osler has said, "Not the magic wand of Prospero, or the brave kiss of the daughter of Hippocrates, ever effected such a change as that which we are now enabled to make in these unfortunate victims, doomed hitherto to live in hopeless imbecility, unspeakable afflictions to their parents and to their relatives."

I have now presented evidence which proves that our knowledge of the disastrous infections and our consequent ability to control them, both in individuals and in communities, have been derived directly from repeated, carefully-planned experiments on animals. The immense saving of life which has resulted is not confined to human beings, however, but is shared by the brutes as well. I need only mention tuberculosis, anthrax, glanders, hog cholera, Texas fever, and rabies, to indicate diseases which have in the past caused the destruction of enormous numbers of domestic animals, and vast economic losses. Happily the measures taken to protect the lower animals against infection can be more rigorously enforced than those used to save human life, and the results therefore are all the more striking. By means of preventive measures, and by protec-

tive inoculations, some diseases of cattle have been entirely abolished in this country, and others have been so promptly and radically dealt with that they have seldom made serious headway.¹⁵

That there is the same possibility of protecting human beings against rabies, against malaria, and yellow fever, and against many other infections, has long been known. Through the application of antirabic virus death from hydrophobia—a hideous death—has fallen from between 6 and 14 in every hundred persons bitten by rabid animals to a fraction of 1 per cent.; in more than 400 cases treated by the virus in Paris in 1910, there was not a single death. Anyone who has read the life of Pasteur knows the dramatic story of his experiments on rabbits, and his thrilling success in the very first human cases which he treated. The conquest of rabies must be regarded as one of the greatest services rendered by animals to their fellow-beings.¹⁶ * * *

Another victory in the campaign to reduce illness and mortality has been won in the fight against mosquito-borne infections. Yellow fever and malignant malaria contributed more than any other one cause to the failure of the French to dig the Panama Canal. The present remarkable freedom from these diseases at the Canal, which is permitting the triumphal completion of that stupendous work, is highest testimony to the efficacy of preventive medicine when well-known methods of control can be thoroughly enforced.¹⁷

* * * Of the volunteer regiments mobilized during the Spanish-American War, 90 per cent. became infected with typhoid fever within the first eight weeks after mobilization. In the entire army nearly 21,000 men were disabled by this disease and more than 1,600 died of it. Last year 12,800 men of the American army were mobilized at San Antonio, Texas, for several months. Only one case of typhoid fever, that of a man not yet immunized, appeared in the entire force. That this extraordinary phenomenon was due to protective inoculation against typhoid infection, which each soldier received before going into encampment, is indicated by the prevalence of typhoid fever in San Antonio during this period. The experience of the British army in India has been similar. * * * The entire process of protective inoculation is a direct outgrowth of artificial immunity previously demonstrated in animals.¹⁸ And the sole hope of rendering wide areas of tropical country fit for civilized society rests on the possibility of eradicating the native diseases through the well-tested and efficacious methods of preventive medicine.

¹⁵ See Moore: A.M.A. Pamphlets, The Protection Animal Experimentation Affords to Animals themselves, and its Value to the Live-Stock Industry of the Country, 1909.

¹⁶ See Frothingham: A.M.A. Pamphlets, The History, Prevalence and Prevention of Rabies and its Relation to Animal Experimentation, 1910.

¹⁷ See Marshall: A.M.A. Pamphlets, Animal Experimentation in Relation to Protozoan Tropical Diseases, 1910.

¹⁸ See Richardson: A.M.A. Pamphlets, The Importance of Animal Experimentation in the Development of our Knowledge of Dysentery, Cholera and Typhoid Fever, 1910.

Such then are some of the benefits to man and to lower animals of the experimental method applied to medical problems. In spite of these benefits, however, strong hostility to this method of studying disease is felt by certain persons, who call themselves "antivivisectionists." These persons have no direct acquaintance with the conditions of experimentation; many of them scorn the evidence that any advantage to man has come from studies on animals; to support their contentions they send broadcast pamphlets in which are printed hostile opinions of medical men who are long since dead, men who had no conception of the merciful procedures of modern experimentation and its life-giving results; or they quote the testimony of spurious experts whose reputations were made in literature, art or theology, and not in the service of healing. However well-meaning their motives may be, their literature for years has been characterized by fraud and trickery and evil insinuation which have been repeatedly pointed out, but with no effect.¹⁹ These methods of American antivivisectionists duplicate those of the English. The Royal Commission which has just reported after five years of study and consideration, has declared of the antivivisectionists, their "harrowing descriptions and illustrations of operations inflicted on animals, which are freely circulated by post, advertisement or otherwise, are in many cases calculated to mislead the public." Both in this country and abroad, therefore, the active antivivisectionists have sought, through garbled statements, false evidence, and inaccurate description, to cast such discredit on medical research as to give the impression that pain and premature death cannot be escaped through application of the experimental method.

Even when these reactionaries grant somewhat grudgingly that the distress of living creatures has been diminished by animal experimentation, they contend that the method of securing this result was immoral and is therefore unjustifiable. What renders the experimental use of animals immoral is difficult to understand when we consider other uses to which they are put. We force the harnessed horse to work, and in time of crisis, we drive him with lash and spur. We rob the mother cow of her calf, and then appropriate her milk. We permit the dehorning of cattle and their branding with hot irons. We do not object to the most shocking barn-yard operations, performed merely to make more palatable the flesh we eat. We slaughter ruthlessly, for sport, myriads of birds and beasts. Myriads more we slaughter for their furs and feathers. We kill for food every year in this country more than 50,000,000 beeves, sheep and hogs, and also 250,000,000 chickens, turkeys, ducks and geese. In nineteen of the largest cities of the United States more than 350,000 dogs and cats are destroyed

annually, merely to clear the streets. Vermin and wild animals we subject to death in uncertain traps or end their existence with distressing poisons. If all injury and destruction of animal life is immoral, why select as an object for attack the treatment of the relatively few animals employed in the laboratories with the object of reducing pain and suffering in the world!

Surely the life of lower animals is not so sacred that we cannot utilize it for our own betterment. Society protects itself from harm by holding dangerous human beings in quarantine, or by incarcerating them, or even by killing them. If attacked by a foreign foe society does not hesitate to send into battle its young men, chosen for their strength, to suffer grievous wounds and death for the social welfare. Such necessary sacrifices of our fellow men are among the tragedies of social existence. The sacrifices of animals, in various ways so essential to the continuance of the human race, may be regarded as among the tragedies of their existence. But of all these, what sacrifices could be more thoroughly justified morally than those of experimentation, which have contributed so greatly to the reduction of suffering and to the prolongation of life, both for men and the animals themselves?²⁰

I do not wish to give the impression that any one engaged in animal experimentation would, under any circumstances, justify the infliction of needless pain. That animals are in fact used humanely for the purposes of medical research has been again and again maintained and demonstrated whenever the question has been carefully examined. The English laboratory inspectors, and the English Royal Commission are unanimous in testifying to the absence of cruelty in experimental procedures. In this country practically all institutions, where animals are used for medical and biological research, have adopted, by public and corporate action, regulations which place control of experimentation with the laboratory director. These regulations provide for the bodily comfort and the sanitary surroundings of the animals, and require all operations to be sanctioned by the director, who is held responsible for the importance of the problem studied and the propriety of the laboratory procedures. Furthermore, the regulations require all operations likely to cause greater discomfort than anaesthesia itself, to be done under anaesthesia, and to be followed by painless death. Only the director can make exceptions to these last provisions, and he can do so only in the rare cases in which anaesthesia or death of the animal would defeat the object of the experiments.²¹

The laboratory director, of all men, is most likely to know what is being done by those about him; more than anyone else he is responsible to his institution, to the public interests, and to his

¹⁹ See Cannon: A.M.A. Pamphlets, *Some Characteristics of Antivivisection Literature*, 1911.

²⁰ For further discussion, see Angell, A.M.A. Pamphlets, *The Ethics of Animal Experimentation*, 1909.

²¹ See Cannon: A.M.A. Pamphlets, *Medical Control of Vivisection*, 1910.

professional ideal; and his position is a warrant of his trustworthiness. To the laboratory director, therefore, the medical profession looks for the exercise of that enlightened compassion which lies at the heart of all medical service.

In spite of accumulated evidence that animal experimentation is conducted in a humane manner in this country, and that strict precautions have been taken against infliction of unnecessary pain, every year in one state or another a "mild" restrictive bill is alluringly presented by the antivivisectionists. Its ostensible purpose is, not to prevent "legitimate vivisection" by responsible investigators, but to stop the practice among the unskilled—for example, the medical student in his room. Examination of the bill reveals, however, that no provision is made for spying on the medical student in his room, but that every arrangement is made for inspection of the responsible investigators. To many persons inspection seems reasonable; they approve of going at least so far with the petitioners for legislation. The medical profession, however, has in the main offered objections to the proposed inspection.²²

These objections are based to some extent on the attitude of the antivivisectionists towards inspection as it has been carried on in England during the past thirty-six years. During all this period no noteworthy abuse of animal experimentation has been revealed by the inspectors. The inference drawn by the antivivisectionists is that occasional inspection is futile; indeed, they declare that, unless an inspector is in the laboratories continuously during all operations, horrible abuse of animals is sure to occur.²³ The impossibility of providing for such constant oversight would suggest to a person of common sense that a reasonable reliance be placed on the good will and natural humanity of those engaged in research. The agitators in this country, however, have argued that when danger of wrong exists, as in the conduct of a bank, for example, inspection is provided, and therefore laboratory inspection should be provided. An important defect in this argument rests in its application. For the inspection of banks experts in banking are appointed, but for the inspection of laboratories experts in experimentation are definitely excluded in the proposed legislation. For this important work the antivivisectionists desire only their own representatives. In the opinion of the experimenters such persons, untrained in observing and judging animal reactions, and lacking any insight whatever into the extraordinary complexities of medical investigation, are thoroughly incom-

petent. Indeed, the most charitable interpretation to be placed on the ridiculously false and misleading statements continually made by these persons is that they are profoundly ignorant of processes which the laboratory workers have spent many years in learning—the most involved and entangled processes in nature, those occurring in highly organized animals.

Apart from objecting to inspection because it has not satisfied the antivivisectionists themselves, because it has not revealed abuses, and because incompetent inspectors are insisted on, we may reasonably regard it as merely the first step in an effort to stop absolutely experimental medicine. In Great Britain there are no less than fifteen antivivisection societies urging that experiments on animals be abolished. In this country there are at least six such organizations whose aim likewise, expressed or implied, is abolition. The agitation for "mild" bills, for inspection, or for slight restriction, by these groups of agitators is, under the circumstances, properly regarded as merely the initial move toward total suppression of what has been demonstrated in these last sixty years as the most powerful instrument of medical progress that has been devised.

The issue then is joined. On the one side are the antivivisectionists who insist that animals shall not be experimented on, even though mankind may thereby be saved throughout coming centuries from pain and premature death. On the other side are the investigators, successors of those who first applied to medical problems the experimental method, a method which, besides delivering into our hands the unlimited energies of the physical world, has in a few decades, wrought marvellous advances in our ability to conserve human life. These men realize that numerous sources of distress are still unexplained. Measles, scarlet fever, infantile paralysis, fatal diseases of the kidneys and liver, cerebral degenerations, the awful scourge of cancer—almost all progress in our knowledge of these afflictions has come from experiments on animals—but how much more remains to be accomplished!²⁴ Men and women and children, whose suffering extends to every one bound to them by the strong ties of love and sympathy, daily go down to death because the disease is a mystery and its cure unknown. Who shall say that experimental medicine shall not continue to bring its blessings? In the eager search for more light, who shall decide the critical case involving pain to animals? The antivivisectionists maintain that they should decide; the physicians, on the contrary, urge that the decision remain in their control. The antivivisectionists, ignorant of the problems and methods of medical research, limit their humanity to the welfare of the laboratory animals. The physicians, perceiving

²² It is perhaps unnecessary at this point to indicate the absurdity of the cry for the "open door." Anyone of insight and judgment is not excluded from laboratories of medical research. In fact in every laboratory with which I am acquainted the doors are freely open to biologists and persons with medical training. To be sure, everybody is not welcomed, but everybody is not welcomed to a hospital operation. The surgeon, operating in a home, does not permit the "open door," he even goes so far as to exclude close relatives of the patient. Yet he does not become thereby the object of malignant suspicion.

²³ See Minutes of Evidence, English Parliamentary Commission on Vivisection, 1905-6, Coleridge's testimony, *passim*.

²⁴ See Ewing: A.M.A. Pamphlets, Animal Experimentation and Cancer, 1909.

that more power to fight disease can only come from more knowledge, trust the deeper humanity of the investigators who are seeking that knowledge. In the end society, which reaps the benefit of medical progress, must determine which of these contending parties shall prevail.

ORATION ON MEDICINE.*

THE SERVICES OF THE SCIENCES TO RATIONAL
MEDICINE.

By HARVEY W. WILEY, M.D.,

WASHINGTON, D. C.

In the shadow of a great disaster which has cost over a thousand lives and brought sorrow into more than a thousand homes in this and other countries, it is a matter of some moment that this convention should assemble here today in the interest of saving human life and promoting human welfare.

We speak of a great battle, like Gettysburg or Waterloo, as a great slaughter where five thousand or eight thousand men may have lost their lives, and yet forget that in this great country of ours many hundreds of thousands of our citizens are dying every year of avoidable diseases which it is the object of this association to prevent.

We can not conquer the great powers of nature by any puny endeavor of the human hand. When we see a great ship hurled against a natural object and crumbling like a shell of paper from its own inertia, we realize it is a mockery to call the work of man titanic, when, at the best, it is only puny and when brought into contact with nature must crumble without struggle.

We have conquered the air both for aviation and carrying of messages; we have accomplished great things in the progress of science in understanding the unknown laws of nature, but we never can conquer nature. The day may come when we will be able to feel at a distance, as well as hear and see, when the presence of an iceberg will make itself known to the mariner at a sufficient distance through the fog to avoid a similar disaster to that which we have just experienced. We know that when particles of antimony and bismuth are placed together they are sensitive to changes of temperature, which produce electrical currents, and it may be in the near future, with some such instrument pointed in front of the vessel, the radiation from the iceberg will be felt at a long distance and its contact avoided, but we will never destroy the iceberg. That will be with us always. And so the medical profession may grapple with all problems of human life as it is grappling with them, it may solve some of them, ameliorate them all, but we shall never conquer death. That will

always be with us. But as we may avoid the threatened impact with an iceberg by the advance of science, so may we avoid premature contact with death by the advance of science.

It seems fitting that the authorities of this church should have placed this beautiful chapel at your disposal, because medicine is only applied Christianity in its final analysis and practice, and it seems that the minister of the gospel and the physician in the future should work hand in hand, and I know of no more fitting place to hold a convention of this kind than in the church of God.

HONOR OF THE CAUSE.

Permit me to thank you for the signal honor which you have conferred upon me in asking me to appear before you today and deliver the oration on medicine on the occasion of the annual meeting of your Association. To one engaged in the active profession of medicine an invitation of this kind would indeed have conveyed a great honor but not a surprise. To me, whose activities have been on the border line of medicine and not in active practice, although many years were spent in preparation therefor, the invitation was not only a great honor but a most complete surprise. I am profoundly grateful to my medical brethren of the great State of New York for this mark of their consideration. Modesty forbids me to attribute it to anything else than to a recognition of the work which I have tried to do in the preservation and promotion of the public health. The honor therefor I cannot accept as a personal one but rather as a mark of approbation for the efforts, especially in preventive medicine, which I have endeavored to put forth.

MEANING OF MEDICINE.

The term medicine may be considered from many points of view. In a very restricted sense it may signify simply a remedy for internal and external use, and indeed this is a signification which is often attached to it, as for instance, "take your medicine." But this is entirely too narrow a view to express the deeper and wider signification which the word carries, not only to the profession itself, but also to a large extent to the public. Medicine has been defined as the science and art dealing with the prevention, cure, and alleviation of disease, and in a narrower sense, that part of the science and art of restoring and preserving health which is the province of the physician as distinguished from that of the surgeon or obstetrician. It is in the greater sense first named that I shall consider the subject today, and I shall regard nothing as foreign to the domain of medicine which tends either to prevent, alleviate or remove disease. A word, however, will not be amiss respecting the dominant influence attached to the term medicine in the still narrower sense as a remedial drug. The physician called to the bedside of a patient who

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

does not "give something" is regarded by the laity, as a rule, as one who either does not know his business or, who knowing it, is afraid to follow the dictates of his conscience and knowledge. On the other hand, the man who is in poor health and who does not "take something" is regarded by most of his fellow men as neglecting practically the only means by which his health may be restored. Advancing knowledge in the medical profession, however, has shown that the physician who often gives nothing is perhaps a truer conservator of health than his brother who gives indiscriminately, and further researches in the domain of medicine have shown that the patient who "takes nothing" in the way of drugs is often in a better environment even in so far as the possible restoration of health is concerned than one who fills his system with drugs. I cannot refrain here from contrasting the profession of medicine of today with the same profession of a third of a century ago. In fact, my impressions of the medical profession are largely those of a third of a century ago at the time I was trained for its practice. There is nothing which remains so persistently in the memory of man as early impressions, and so I can recall today the precepts of my teachers in medicine with greater accuracy than I probably could a lecture I may have heard only a week ago. Thus my impressions of medicine in those, which we may now call benighted days, are extremely vivid; and those impressions lead me to the conclusion that medicine of thirty or forty years ago could hardly be regarded as a scientific profession. The best that could be said of it perhaps is that it was scientific empiricism.

It is not wise, however, to compliment our present knowledge too highly. It is barely possible that in another forty years the orator on medicine may look with as much compassion upon the knowledge of today, as I do upon the learning of that bygone time. In fact, the most wonderful appeal which is made to the imagination at the present time, in view of the great strides of progress which have been made, is the thought of what lies in the immediate future. As we look back upon the history of the past third of a century we see a steady and systematic progress from the realm of empiricism in medicine towards the realm of scientific reality. The thought also presents itself that, after all, the human organism itself is the best physician, for otherwise how can we conceive of the great number of recoveries that took place in the face of ancient practices? I have heard physicians regret that George Washington, in his last illness, should have been treated by that science of medicine in which calomel and phlebotomy were the cardinal principles. George Washington died of his attack of pneumonia, but can those who are treating it in a so-called scientific way at the present day boast of much greater success? The

conviction thrusts itself upon us, in view of this condition of affairs, that the great and most un-failing source of success in medicine in the future will be with some tolerant and enduring human organism which has resisted the onslaughts of the profession and of disease in the past. Men get well under calomel and phlebotomy; men die under antiseptic surgery and scientific medication. Perhaps then the fundamental tenet of medicine today is the preservation of the animal resistance in its highest state of perfection as the sovereign remedy against all forms of disease. But it is not my purpose to indulge too extensively on the present occasion in therapeutic animadversions, but rather to trace the effect of the development of the sciences in general upon the art and science of medicine. Perhaps it may be said that this is an ambitious theme for a single hour, and I acknowledge that this is true; only a volume of hundreds of pages could do justice to this subject, and I hope only to skim along the surface and touch the high points, the *fastigia rerum*, of scientific medicine. It would hardly be fair in speaking of the services of the sciences to leave any of them unmentioned, but I can only speak of some of the more important potent sciences and dismiss the others.

ASTRONOMY.

In the case of astronomy it is difficult to say that this science has had any specific influence on scientific medicine, and yet we should not forget that astro-therapy is one of the oldest branches of medicine and the world is yet full of persons who are believers in the influences for good or evil of the stars, either singly or in conjunction. The horoscopes which foretell your fortune also often make your vital vicissitudes the venture of vaticination. It is not wise to deny that any of the forces of nature have power for health or disease. When we consider for a moment how the astral bodies act and react with each other to produce the equilibrium which makes the universe stable, we can hardly deny that such a vast source of interacting forces may not have a direct influence on physiological and pathological conditions. The condition of the sun's surface has often been cited as having influence upon the meteorological conditions of the earth, and the meteorological conditions of the earth fortunately or unfortunately have a potent influence on health. Hence we may admit that it is possible that a new outburst of spots on the sun may increase or decrease the number of invalids upon the earth's surface. It is not my purpose to trace any scientific connection between the solar phenomena and mundane health, nor could I if I so desired. I need, however, only to call your attention to the fact that the sequence of the seasons, the storms, and droughts and breezes, the hurricanes, the tides and the waves, are wholly dominated by stellar forces, the sun itself being the most potent star. The sun, however, is only

an atom in the stellar universe, and the influence of even a star as distant as Sirius may not be wholly unmeasurable.

With perhaps the exception of chemistry, astronomy is the most exact of the sciences, and yet its laws are only partially known, and it remains for future investigators to determine the extent of *helic* and *astral* phenomena upon health and medicine. I, for one, am of the opinion that the influences of the vast systems of worlds upon each particular world are dominant and eternal. The difficulty which we encounter is in estimating the particular kinds of forces, and the particular effects upon each particular atom in the cosmic molecule.

PHYSICS.

Closely allied with the physical cosmos is the science of physics itself, which has of late years undergone such wonderful development. It is rather difficult to distinguish the dividing line between physics and chemistry, but in speaking of the effect of this science on medicine a transgression of the boundaries between the two sciences must be permitted. The most prominent features, however, of physical science to which attention should be called are those of late development. The existence of forms of radiant matter of intense activity is only a recent discovery. As is usually the case the newly discovered powers are exploited as a fresh gold mine would be, and more importance is attached to the value of phenomena of this kind by reason of their newness than is probably their due. So the discoveries in the domains of physics bordering on chemistry of the Roentgen rays, of radiant matter, of colorless light, of the supposed ions and electrons of the physical world have probably been magnified beyond natural proportions. I need only call your attention to the supposed utility of the radiant forms of matter for alleviating certain difficult diseases such as cancer and allied troubles. By means of the Roentgen rays, however, important contributions have been made to that branch of medicine which is known as diagnosis. Radiographs of the body reveal in the first place, deformities, fractures, dislocations, and in the second place give a picture of the internal organs which is more or less valuable for diagnostic purposes. Electric light has been used to illuminate many of the cavities of the body before invisible, and with the use of the electric light which may be introduced into the cavities of the body various derangements of the organs may be ascertained. Hence the utility of this branch of physical science to medicine is not easily overestimated. Closely associated with this idea is the tremendous power of radiant matter, especially that which emanates directly from radium, and its compounds upon the living organism. Numerous instances of serious, and even dangerous, injury have been reported from the care-

less employment of the salts of radium. Too much praise has doubtless been given to their curative properties, and we are a long way from having scientifically demonstrated just to what extent the Roentgen rays and radiant emanations may prove beneficial, and in what particular forms they may be harmful. But little, however, has been done to show the tremendous importance of these hitherto unknown factors of matter and hence we may say from this brief sketch that the evolution of physics in the borderland of chemistry has had a tremendous influence upon medicine, and will have a greater recognition in the near future.

BOTANY.

The science of botany has always been of pronounced value to medicine by reason of the fact that many of the weapons in the medical arsenal are furnished by plants. For this reason the advancing knowledge of plant life, of the discovery of new species and of the modification of old ones are all matters that bear directly upon medicine. Vegetable preparations have been valued from the earliest times for their medicinal properties, and those of wild growth have been specially sought in all quarters of the earth and used most extensively for medical purposes. Even before the science of botany was known some of the principal preparations which were supposed to be efficacious in the alleviation of disease were made from plants. In the last few years, however, a systematic attempt has been made to render the science of botany more effective in the province of medicine. This has been especially seen in the attempt which has been made to introduce medicinal plants into this country, an attempt which has been prosecuted with vigor and some success by the Department of Agriculture. It will be interesting to note the effects which are produced upon the composition of these vegetable drugs by reason of the artificial conditions in which they have been grown. It has been found that the environment makes a profound impression upon the activity and the quantity of the remedial constituents of plants, sometimes increasing an active constituent, but usually decreasing it. Thus acclimatization of plants of supposed medicinal qualities may result in the practical elimination of these medicinal qualities from the plant itself, and the tendency is certainly towards elimination, rather than towards increase, although it must be said that the experiments have not been carried on long enough to warrant positively the assertion that the acclimatization of wild plants tends to reduce the vitality and quality of the remedial substance contained therein. In general it may be said that when savage plants are brought under culture some radical change in their constitution may be expected. Many of them simply refuse to grow at first, though perhaps by persistent

efforts all wild plants might be domesticated. The contributions to the armament of *materia medica* which may be expected from the domestication of wild plants cannot be foretold. All that can be stated positively now is that efforts are making but results are not abundant. The service of botany in contributing so many valuable remedies for the use of the physician cannot, however, be too highly estimated. Botany itself, like other sciences, has undergone rapid mutations, and it now embraces wide fields of study and research aside from the mere study and analysis of plants. In fact, botany has come to be known as the name of a group of sciences working upon plants rather than as a means of describing, classifying, and naming plants themselves. Among the other sciences which have been thus incorporated more or less in the service of botany are chemistry, physics, heredity and kindred fields of study.

CHEMISTRY.

That science which has furthered medicine the most of all, and it is an exact science, is chemistry. Not only has it been active in connection with the service of botany, but it has been intimately related to diagnosis and therapeutics. The physician has gradually come to learn that the human body is an engine made up of various correlated parts, fed by fuel, and regulated by automatic oiling and control. He has found out that each of its functions is performed under immutable law and that the whole is governed rigidly by the principles of thermodynamics. Having learned the true nature of the organism, his attitude toward that organism has of necessity undergone a profound change and the chemical laws which underly the beginnings of life, the embryonic stages of the living being, its growth and its maturity, have widened the field of medical knowledge and broadened the view of the medical practice. Attention need only be called to the investigations of Loeb and his school to show how profoundly the first beginnings of life may be modified by a change in the chemical environment. It is true that the sea urchin is far removed from the human being, but it is likewise true that the laws of growth which condition the existence of the sea urchin are the same as those which obtain for the most highly organized man. In so far as I know, an actual living being, in the ordinary sense of that word—that is, a being capable of self-perpetuation and of transmitting life to other beings—has not been even approached, but much progress has been made towards solving the riddle of life by a keener sense of the relations of chemical science to the so-called vital phenomena. The best service which these investigations has rendered has been clearly to point out that the supposed existence of some element of vital energy in the living being which do not exist in other matter is a myth. The laws

which govern the formation of the crystal, the accretions of the stone, the growth of a mineral, the segregation of material in solution into a mass of similar chemical structure, are no less vital and mysterious than the action which produces a plant or a seed, an animal or an egg. The laws which determine the motion of bodies in solution, and even of solid bodies within each other and through each other, are found to be simple principles of physical chemistry, and not to depend upon any unknown or undiscovered cause. While this is all true we cannot fail to acknowledge that life and growth are just as much a mystery as they were before. We have only learned to recognize some of the laws which control them; we have gained no knowledge in regard to their ultimate source and destiny. Nevertheless, I would not consider it an idle expenditure of time and talent still further to pursue by chemical means the search for organized life. We know that all the phenomena of growth and decay are purely chemical and hence we would not be justified in denying that the very origin of life must have been due to a happy taxis of stray elements. The fact that man has never been able himself to produce such an arrangement only emphasizes the shallowness of his knowledge and not the impossibilities of the problem. Chemistry having shown its close relationship to the origin and proper progress of life, has also revealed the nature of the chemical changes which take place in normal activities of the living cell, or aggregate of cells. This normal function itself is the basis of physiology, but the detection and control of the phenomena and their quantitative measurement are strictly chemical. It is, therefore, impossible to separate chemistry from physiology. While chemistry would exist and be a great science without physiology, rational physiology without chemistry would be largely a building of terms. Those intricate workings, and interworkings, of osmotic pressure due to differences in saline content and to the relations of these different solutions to the cell walls separating them, form the fundamental condition of a large part of the activity of the living being, whether plant or animal. It cannot be denied, therefore, that chemistry has wonderfully expanded our knowledge of physiology and thus proved a most valuable contribution to the science of medicine. A few years ago there were many organs in the body whose functions were not understood, and therefore there was no known physiology for these organs, but the progress of chemistry applied to physiology has gradually shown that these organs are not mere accidents of the living organism, but that they have distinct and useful functions resulting in the production and distribution of different chemical compounds. We now know what comes of the activity of the thyroid, the adrenal, and other glands. We now know, thanks to the expansion of physiological chemis-

try, that no organ of the body performs its function in an independent manner, but that certain messengers go from gland to gland and from one part of the body to another arranging and adjusting the *modus vivendi*. The hormones are the chemical peace-makers and the walking delegates of the body, bringing into harmonious relations its various organs and their activities and preserving and uniting a compact unit working to a definite purpose. But I can only touch upon these wonderful accomplishments of physiological chemistry in the hour at my disposal. I must pass on to some other considerations.

BACTERIOLOGY.

While medicine is not directly interested in the morphology of bacteria this branch of botanical investigation is of deepest interest to scientific therapy. Infection, asepsis and antiseptics are studies of supreme importance and they cannot be fully mastered without some knowledge of bacteriology. But the chief interest in this study centers in what do these organisms do? The answer brings them well within the domain of chemistry. These tiny plantlets promote health and growth and condition disease and decay. Not only in surgery but in vaccine or serum therapy the role they play is of the highest significance. In prophylaxis bacteriology is one of the most useful sciences that the physician has at his command.

MICROSCOPY.

The art of microscopy founded on the science of optics has been an immeasurable aid in the applications of chemistry to medicine. That which brings into view the unseen cannot fail to add to the sum of human knowledge. Even though the science of optics itself, which is the basis of microscopical research, can apparently have no direct relations to medicine, microscopy would have failed largely of its purpose had it not been working hand in hand with chemistry. It was a happy discovery, therefore, that certain organisms were capable of absorbing and retaining definite coloring materials which seem to have only slight if any affinity for other organisms or organic tissues which may be present. The staining of microscopic objects, which is an application of tinctorial chemistry, has raised the microscope from a mere implement of optical skill to one of the most powerful means of studying the most intimate phenomena of life. This has been particularly illustrated in the microscopical study of bacteria. Bacteria are supposed to be of a vegetable nature, though in the present condition of advancing science I fail to discover any particular test which separates living bodies into animal and vegetable. Be that as it may, these organisms have a remarkable faculty of being susceptible to particular stains and thus being brought into prominence in the microscopic field by reason of the color which they carry. When it

is once ascertained that a particular organism is colored by a particular stain, the means of identifying that organism among its fellows is at once provided. In a further application of this principle the question arises as to whether there might not be pathological organisms of a virulent type other than the bacteria which have already been mentioned which may not only absorb a particular color but also a particular and specific poison? If such should be found to be the case, a poison which was specifically active for such a pathogenic organism might be safely used within bounds for its destruction without producing any general toxic effects. The application of this principle of chemistry has led to investigations of various chemical compounds which are poisons in themselves or which contain a poison with the hope of finding some one of them with the specific properties above mentioned. We are all aware of the fact that some such discoveries have already been made, for example a certain preparation containing arsenic has been found to be useful in destroying the life of the organisms producing syphilis. Just how far Ehrlich may have been influenced in the search for this remedy by the facts I have mentioned concerning the staining of bacteria for microscopic examination, I am not able to say. It is, however, such a logical sequence to step from the investigation on specific stains to the other one on specific poisons that it seems to me the first must have led to the second. In this connection of prophecy may perhaps be permitted, which is not offered as a certainty, but as a hope only, and prophets are wise when they place the fulfillment of their predictions at a period when they themselves are likely to have finished their earthly course. I venture to prophesy, therefore, that within perhaps a quarter of a century that which has already been accomplished for syphilis may also be achieved for cancer. Cancer is the one sinister disease which holds us in constant fear, which has not yielded to the progress of scientific medicine the secrets of its existence and transmission. Though the experimental work concerning the origin, nature, and prognostication of cancer is going on in several centers of the world in such a splendid way, we are still working to a certain extent in the dark. It will indeed be a glad day for the world when the scientific investigator in medicine adds this long desired victory to those which have gone before in the realm of chemical accomplishment.

PATHOLOGY.

But chemistry does more than seek new remedies, thousands of which it has already offered to the medical profession, many of which have stood the test of the pharmacologist and the physician. While physiology has been defined as the sum of the chemical reactions of the healthy organ giving definite chemical products, pathology, which is the deformed sister of physiology, is no less

subject to chemical dicta, and it has been found that the abnormal exercise of functions gives rise to abnormalities in the chemical products of the organs. Hence chemistry has been practiced with a view of throwing light upon pathological changes, and in this field it has worked with equal success. While some of the excretions of the body have been under examination for many years as an index of pathological changes, it is only within a short time that the physician has realized the supreme necessity of a thorough study of all the excretions of his patient. The urine is not the only one although perhaps the most important. The examination of the feces, the sputum, the perspiration, and of the other excreta are all valuable indices to the nature of the pathological changes going on. The chemical laboratory, therefore, has become an indispensable adjunct to the clinic and to the physician's office, the data obtained therein have been widely increased over those obtained by the old simple examinations of a quarter of a century ago.

NUTRITION.

Thus chemical control has at last begun to throw light upon the processes of metabolism which are so woefully disturbed by pathological changes. The nutrition of the physiological unit is a question of the utmost importance, but by reason of the toleration of the living body to wide changes of environment, slight disturbances of nutrition in a healthy person are borne by the system. With a pathological condition of the patient the normal functions are deranged or disturbed and hence the normal principles of nutrition which would be a guide in a state of health cannot possibly be applied in their entirety in a state of disease. The physician, therefore, to meet this exigency must realize that in the future he will be expected to be a master of the principles of diet and nutrition and not merely the empirical enunciator of what his patient shall and shall not eat, which he too often is to-day. I have frequently wondered what the result would be if a dozen of the most eminent specialists in diseases of the digestive organs were to examine the same patient as nearly as possible at the same time and then to prescribe for him a diet which they supposed would be useful in the conditions presented. A list of the dietaries thus suggested would be without doubt a most interesting contribution, not, I will say, to medical science but to medical vagary. The science of chemistry offers itself to the science of medicine in these intricacies of the way, as a useful helper, and sometimes as a guide.

PHYSIOLOGICAL CALORIMETRY.

Atwater and his assistants, and among these Benedict especially, have shown how by the exact measure of body heat and the products of combustion the laws of thermodynamics are rigidly applicable to the phenomena of meta-

bolism, and have done much to place the science of nutrition on a strictly scientific basis. The vital functions, so called, are found to be simple chemical phenomena which range themselves in complete order in luminous schedules.

Benedict has lately employed the calorimeter in the study of disordered metabolism and especially that form of derangement in which carbohydrates escape destruction. There is hope that from such studies the empiricism of the present theories of nutrition in diabetes may be removed and a fundamental theory of diet be established in its place. The increasing mortality due to nephritis, diabetes and Bright's disease should be checked as the result of such studies.

PHARMACOLOGY.

Pharmacology is a science which must not be neglected in this brief review because, with all its shortcomings and with all the strained conditions in which this science is practiced, we cannot deny the useful position of guide and adviser which it has filled with such distinction. It is true that the direct introduction of drugs into the living body is likely to be attended with variations from the ordinary method of exhibiting them which may be of a distinct and even serious nature. But we cannot deny, on the other hand, that the real effect of the drug is that which is produced by the drug itself, and directly, and not by the drug as modified by admixture with the food and subsequent consumption. The ultimate tendency in both cases is, it seems to me, the same, but there is a possibility of delayed action by the administration of the drug with the food, so that it would require a very much longer period of observation to determine its real effect than would otherwise be the case. Pharmacology will at least reveal the nature of the most powerful drugs—those that threaten very serious change of function or even health and life, and hence its practice could not be suspended without a most serious blow to the progress of scientific medicine. At the same time we should not forget that all searching for truth should be done with as little disturbance and discomfort as possible, and hence the animals which are used, particularly for pharmacological studies, should be humanely treated and by the use of proper anesthetics be saved from any conscious pain or suffering. I need not stop here to give even an outline of the great contributions which pharmacology has offered. One need only open the catalogues of manufacturers of synthetics for instance to see the wonderful progress which has been made. Perhaps there is some element of danger in this too prolific science, namely the encouragement of the physicians to use drugs to a larger extent than they otherwise would. Drugging is a dangerous practice as every wise physician knows and hence we should not yield to the insistent demand of advertisements to "give it a trial." The profession should wait, and wait

patiently, for the chemical, pharmacological, and physiological effects of each proposed remedy to be thoroughly studied and its virtues incontestably shown before becoming experimenters themselves on the bodies of their patients.

IMMUNITY.

I could not leave this theme without calling attention to some of the wonderful accomplishments of other sciences in their applications to medicine. The studies into the causes of immunity from disease have been epoch making in the last quarter of a century. If Jenner could have lived to see that his discovery of the application of the virus of smallpox was to be justified by the most rigid investigations it would undoubtedly have been the proudest day of his life. The whole theory of immunity has been taken out of the realm of pure empiricism and placed upon the rock of scientific truth. The fact that the system when infected, immediately sets about the production of an antibody to neutralize the poison, to my mind, is one of the greatest scientific discoveries which has come into the medical world. Based upon the search for sera which by injection can produce, and this before the disease has had a chance to establish itself, a condition of immunity by the artificial production of anti-bodies, is a fact of the highest significance. Coupled with this should be mentioned the discovery that the healthy, well nourished individual has a power of resistance to infection which is marvellous. Even if we should not succeed in exterminating the sources of infection entirely we make the human race so immune to the ravages of infectious diseases as to render their effects upon the death rate negligible. In this connection the discovery of Wright that the power of resistance of the body rises and falls, and that the leucocyte which is active in this matter does not always have the same ability to destroy intruding organisms has been a step forward of the greatest significance. That the condition of the blood may be so modified as to either increase the activity of the phagocytes on the one hand, or to diminish the resisting power of the intruding organism on the other, is a fact of great promise to the future of the profession. While it is true that the original method of determining the opsonic index is laborious and complicated, the process has already been simplified by Crane and others so as to give promise of being a workable method at the bedside.

THE DESPOTISM OF CREEDS.

Fortunately there is no creed or doctrine to which the true physician must subscribe. The science of medicine does not know the name of any school which restricts the activities of investigation or the belief which the true physician can bear. The introduction of scientific methods into medicine has shown that in practically every so-called school of medicine there is some kernel

of truth which may be valuable to the physician, but which has been used beyond its natural limit of application by the school in question, so as to reduce it to absurdity. All that is good in all the schools or creeds belongs to the science of medicine. Many of the so-called schools are only branches of medicine as it is practised today, and this is true of psychotherapy, of hydropathy, of electrotherapy, of bromatotherapy and of radiotherapy. There are other so-called schools of medicine, such as allopathy, homeopathy, osteopathy, *et cetera*, which are of a character to defy accurate description. One of the chief objections to such creeds is that they narrow the limit of medicine to such an extent that there is no room for expansion without transgressing the creed. It is with medicine as with religion: creeds restrict and restrain. They breed distrust and denunciation. They incite prejudice and battle. If they are useful it is because they make people think and consider, and every discussion of every problem leads gradually to the elimination of error and the establishment of truth. How narrow seems the path that is bounded by creeds and theories of this description! Science has erected a huge monument, from the pinnacle of which the true physician surveys the whole world and gathers all that is good from all that comes within his vision. Meanwhile he finds that for the purposes of his profession, for the enlargement of his vision, for the increased power of his armament, he must rely more and more upon the fundamental sciences which furnish the foundations of medicine. Anatomy, physiology, pathology, botany, chemistry, microscopy, bacteriology, physics, pharmacology, nutrition and diagnosis are the fundamental sciences on which his art must be built. Only those who are grounded in some or all of these sciences, and who believe in them, and who are guided by them, can with safety and with proficiency master their art, and thus become true benefactors of mankind.

THE DUTY OF THE FAMILY PHYSICIAN IN THE MANAGEMENT OF SURGICAL CASES.*

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INASMUCH as the subject of this address was suggested to the speaker by certain members of this Society, he feels that his only responsibility in its presentation lies in the fairness and frankness with which it is done. It is a subject which brings up questions other than the purely stereotyped, the discussion of which is timely rather than agreeable, but which are

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coming more and more to demand serious consideration by the medical profession. The duty of the family physician in relation to surgical cases will be considered from three points of view: first, and most important, that of the patient; second, that of the physician; and third, that of the surgeon. It also involves three periods: before, during and after operation, each presenting its own significant problems. These duties are obviously so manifold, so varied, so important, that it is impossible to do justice to the whole subject. To go into detail would be wearisome and out of place before an audience such as this. It will be my endeavor, then, to confine my attention to a consideration of certain general propositions which, it seems to me, embody the important elements in the question. In the beginning let us look at it from the standpoint of the patient. The ideal from the patient's side is extremely easy to present: the minimum of danger, delay, disability, and distress, and at a fair cost. This demands an early diagnosis, prompt competent surgical treatment, and hardly less important, that too often utterly neglected duty, the after-care of the patient. I think everyone will admit that the welfare of the patient should always be first and foremost in the mind of the physician. His own interests are ever to be secondary to those of his patient. Just here, unfortunately, is where occasionally it is observed that the converse of this proposition is true, but I think it can be said without fear of successful contradiction that it has ever been the glory of our noble profession that the individual members of that profession, with few exceptions, have always been willing to sacrifice themselves and their own interests for what they conceive to be the good of their patients. There will come at once to the mind, I am sure, of every one of us, instances or circumstances in which the interests of the patient and those of the physician may come into direct conflict. I am also sure that every conscientious physician has not infrequently been haunted by the thought that some patient of his, possibly a wealthy and influential individual in the community, who wanted, and who could well afford to pay for the best, might fare better if under the care of someone else who had had better opportunities, perhaps, or was better equipped than he to give the needed attention. Under these circumstances, what should a conscientious physician do? Confide his fears to the patient and thus lose first his confidence, then the patient himself, or ask for a consultation, and after having obtained an expert opinion and advice, continue in charge of the case? Or trust to luck, and bluff it out? Many questions such as these, which are of real practical importance, both to the physician and the patient, are continually presenting themselves. How shall they be answered? These general propositions apply with equal force to the whole subject of medicine in general. Have

they any special significance in their relation to surgery? I think they have. From the very nature of the case, surgery must be considered as a specialty. It can only be properly done by one who has been trained from his youth up, and who has been thoroughly well grounded in the fundamentals of the science. Unless one knows and thoroughly appreciates the principles concerned in the handling of tissues, in the repair of wounds, in the causes and results of inflammation, in the characteristics and manner of growth of malignant diseases, in the principles of physical science involved in the production and reduction of fractures and dislocations, and in a hundred other points of importance, which time would fail us to mention, he cannot ever hope to get a thorough grasp of questions which are vital to the complete understanding and proper management of surgical problems of every-day occurrence. Too much stress cannot be laid upon, or too much importance attached to the assertion which has just been made. It has been said that a surgeon, like a poet, is born and not made. Personally, I do not believe that that statement is altogether true. Unquestionably, some individuals are born with a natural aptitude for surgery, a something which has been characterized as the surgical instinct, and which every teacher can recognize at once as present in varying degrees in the medical students under his care. It is very far from the speaker's purpose to belittle in any way the art of surgery, which is of very great importance and which, in the hands of some skilled operators, has certainly become developed to the highest degree. It must be conceded, nevertheless, that however high a pinnacle the art may occupy, the science of surgery still overshadows it, and unless one is well grounded in the principles of true scientific surgery, it must degenerate into something of a trade, or a sort of sleight-of-hand performance.

My honored preceptor, the late Dr. John Homans of Boston, a man of wide experience, excellent judgment and possessing to an unusual degree, the characteristics and knowledge which we have been endeavoring to describe, remarked upon one occasion, "Any fool can cut off a leg, but it takes a surgeon to save one." This characteristically epigrammatic remark of his, very well illustrates the point I am endeavoring to make. Surgery is not alone an art. The day of the barber surgeon is over. It is a science, founded upon certain fundamental principles, without a thorough knowledge and understanding of which no man can do his patient or himself justice. Now what is the application of all this? If our premises are correct, the conclusion is obvious, namely, that no doctor, no matter who, without a thorough surgical training has the moral right to attempt to make a practice of surgery. He may succeed in doing certain minor operations or even certain major op-

erations well, he may learn to do, by rote, certain things fairly satisfactorily to his patient and himself, and he may meet with a fair percentage of success, but sooner or later, he will meet his limitations, and in attempting to go beyond these with his limited and imperfect equipment, some of the catastrophes of surgery are liable to happen, and then who pays the price of his ignorance and temerity? The public is beginning to understand that surgery is too serious a matter to be lightly undertaken by those who are not thoroughly trained in its proper performance. Right here let me sound a note of warning and in so doing I do not wish to be misunderstood: the tendency nowadays is toward the multiplication of hospitals, a tendency that is to be encouraged under proper safeguards. With the general proposition that a hospital is the only place in which to be sick, that is surgically sick, I am in the heartiest accord, provided only that the hospital is under proper management, and that the surgeon, for I am speaking now only of the surgical aspects of the question, is thoroughly competent to handle surgical cases. But what do we see? As a matter of fact, in my own State, and I think that is a correct index of the situation throughout the country, hospitals are multiplying in many of the smaller towns, towns of a few thousand inhabitants, where there are no skilled surgeons, and—here is the danger—where the general practitioner is tempted to assume the role of surgeon. There are two general reasons for this. In the first place, the responsibility for a surgical operation in a private house is undivided. The surgeon alone is responsible for the good or bad result, whereas in a hospital it is somewhat different. The reason for this is not easily explained, but it is true nevertheless, that in the case of a patient operated upon in a hospital, there is not the same feeling of individual responsibility upon the part of the surgeon held by the community at large, as in the first instance. In the second place, under the cover of the hospital, and in the more or less seclusion of its operating-room, the would-be surgeon is tempted to do things that he would not dare do under other circumstances. Particularly is this true, and this is no joke, where the operating-room is furnished with all the modern appliances of the up-to-date hospital. I have in mind now a certain beautiful operating-room in a hospital in a small city, the money for which was left as a legacy, a large sum to be specifically expended in the construction and equipment of this particular room, a room walled and ceiled with marble, finished with polished brass and shining glass, everything in it of the costliest description. What is the result? It would appear to the uninitiated impossible in such a hygienic sanctuary, to commit a surgical sin, and yet one constantly sees in that operating room heinous crimes committed against the most fundamental surgical principles and technique which ought always to

be kept inviolate. And why is this? Because of those who habitually use this room, not one is a trained surgeon; they have, so to speak, just picked it up. In the gradual evolution of this palpably wrong condition of affairs the surgeon himself, or more strictly speaking, some surgeons, are not wholly blameless. There is no royal road to surgery. There is no such thing as surgery made easy. There is no trick about it that can be gotten onto in a ten lesson course by watching the manual dexterity of some especially clever operator, and hearing him vociferously declaim against the old accepted principles of the fathers, and the newer scientific, or so-called laboratory methods. It is easy to be led by such false gods into believing that anybody can perform a surgical operation; it looks so easy and it seems so simple, as they do it. But don't be misled into the fatal error of supposing that that is all that there is to it. It means a long hard journey, years of close application and study, of mental and manual training, of observation and investigation in hospital ward and laboratory, before a man can reach in anything like its fullest meaning, the proud distinction of bearing the title of surgeon and all that it implies. The remedy for this is easy. Do not abolish hospitals, but restrict the practice of surgery to the trained surgeon.

What has been said as to why the family physician should not operate, is rather from the standpoint of the patient. He cannot do the patient justice. Owing to lack of proper training and sufficient experience, his judgment and execution are necessarily at fault. But important as this is it seems to me that there is something to be said also from the standpoint of the physician. There is a moral question involved. A family physician is attempting to do something that, in the vast majority of cases he is not competent to do, for the reasons above mentioned. He is placing himself in a false position before the community, and is laying himself open to charges which in the present enlightened condition of the public, and certainly in some parts of the country, it would be difficult for him to disprove. There are those in every community stimulated by shyster lawyers of the ambulance-chasing type, who are not slow to take advantage of every mistake, or fancied mistake, upon the part of the operator, and it is well, therefore, for every doctor, no matter who, before he assays the part of surgeon, to weigh well the responsibilities that are involved. He should be in a position to prove to an intelligent jury that he has given his patient the benefit of skill equal at least to that which can reasonably be expected from the average well-trained surgeon. This, it appears to me, it would be difficult, indeed impossible for the family physician to do. The thoroughly conscientious man will think twice, and go very slowly before allowing himself to be forced into this position. Of course, I

am not referring to those cases of emergency surgery which every physician at times is called upon to do. In these instances, common humanity and surgical instinct demand that the best be done for the patient, and that immediately, even to the extent of a capital surgical operation, in order to relieve temporarily the patient's suffering, or to save life pending the arrival of the skilled surgeon. Then, too, this matter of operating by those not prepared for it, tends toward the lowering of moral and ethical standards in other directions. It is a great temptation to do this sometimes because the vast majority of doctors are dependent for their living upon the returns from their practice, and it frequently means a great deal for a doctor to turn over to the surgeon a good patient, perhaps wealthy and prominent in the community, in which event the surgeon, after the operation, collects a substantial fee, and the doctor often receives little or no recognition or pecuniary return for his advice and services. What then is to be the position of the family doctor in respect to the management of surgical cases? Is he simply to act as barker and catcher, whose sole function it is to inveigle into his clutches the innocent and unsuspecting individual, and then turn him over to the surgeon to be fleeced, to his own financial loss? By no means! Of course, it goes without saying that only a comparatively small percentage of the ordinary practice of the family physician has to do with surgery, so that on the whole, the effect upon his income of turning over all surgical operations would be slight; but it is the principle of the thing that should interest us rather than the practice. Right here, of course, presents the opportunity for fee splitting or for a rake-off in some form or other. This practice needs only to be mentioned to be condemned in unmeasured terms. There need be no reason whatever for the existence of this blight upon the good name of the profession, if the surgeon, upon his part, does not in his selfish greed, exhaust the financial resources of the patient by exorbitant fees, leaving nothing with which to remunerate the family physician for his long continued and perhaps less showy services. If the principle of the Golden Rule was always applied by the surgeon, as well as by the family doctor, papers such as this would be out of place.

The position and the duty of the family physician are at all times exalted and honorable. He is the high priest of the home, and the father-confessor into whose care and keeping are committed the keys of the closet containing the family skeletons. What higher or more sacred trusts are kept by any one? The family physician can be, by wise counsel and advice, of the greatest help to the patient in the selection of a surgeon. The layman cannot be expected, indeed is in no position, to know who is the best surgeon for his particular malady, for it is an open secret that there is choice even among surgeons. Once the

operator has been selected, the physician can be of the greatest help and assistance to the surgeon in the further conduct of the case. Various questions are liable to come up at once. At such a trying time the patient and his family need moral comfort and support. In my experience, it is the family and the anxious friends rather than the patient who are responsible for most of the troubles of the medical attendant. The surgeon may be an entire stranger to the patient and his friends, and little may be known by them as to his ability and skill. Reassurances upon the part of the family physician may go a long way toward allaying unnecessary apprehension. The questions of removal to the hospital, and the choice of hospital, are of prime importance. The matter of the financial circumstances of the patient, the question of the proper fee, disagreeable but necessary concomitants of a surgical operation, if frankly discussed and satisfactorily settled to all concerned, *before the operation*, would do away with a great deal of the misunderstanding and unpleasant criticism which, unfortunately, one sometimes hears, for however unpleasant it may be so to view it, it is nevertheless when divested of sentiment, purely a business transaction between patient and surgeon. As soon as the operation has been done, whether in a private house or, preferably always in a hospital, there should be no question as to who is responsible for the further management of the case. Division of responsibility always paves the way to trouble or disaster. The surgeon and he alone should be responsible for the after-care and treatment of the patient, until such time when in his judgment the patient can be safely returned to the care of the family physician. Every operator who has had any considerable experience in private practice, particularly with operations in private houses, must have observed instances where, with the best of intentions, the family physician has unwittingly added to the discomfort of the patient and the responsibility of the surgeon, by administering favorite remedies for pain or nausea, or allowing certain articles of diet which, under ordinary circumstances, would probably be followed by satisfactory results, but after a surgical operation are absolutely contraindicated. I know of no department of surgery where there is a greater demand for the exercise of sound judgment, or where properly interpreted, experience is of more real help than in the after-care of certain classes of operative cases. This particular judgment and knowledge, born as it is of wide observation and experience in the management of such cases cannot of necessity be possessed by the family physician. In the matter of surgical dressings and the application of different forms of apparatus for the correction of deformities, etc., the same thing is true.

For every reason, then, especially in the management of the various emergencies which may

arise in connection with surgical operations, the skill and experience of the trained surgeon are indispensable. Many of the unpleasant sequelæ of surgical operations, such as peritoneal adhesions about drained abdominal wounds, stiffness of joints, pressure paralyses, etc., may be avoided by the institution, at the proper time, of the proper remedies.

In spite of what has been said, one occasionally meets with the desire upon the part, especially of some not well-informed physicians, to meddle, I cannot use a softer word, with the after-care and treatment of operative patients, a practice that should be consistently discouraged. At such times, the surgeon, and he alone, should have the responsibility and the say, but he can often receive material assistance in many ways from the family physician.

Since the general practitioner is the first one to whom the patient applies for an opinion and advice as to his particular malady, and since the earliest possible moment at which a given condition is seen and recognized is the most favorable time for the prevention of an operation, where that is possible, or for the best immediate and permanent results therefrom, it is of the utmost importance that a correct diagnosis should be made at the earliest possible moment.

Bloodgood, in a recent paper, has called attention to the difficulties in the way of early diagnosis, and to the prime importance of the family physician being so far as possible an expert diagnostician. It so often happens that by the time the surgeon is called in the golden opportunity of curing the patient is lost, and all that is left to be done by the surgeon is simply a pitiable makeshift in the way of a palliative operation. As Bloodgood justly says, "Early recognition of the disease in some cases, followed by proper treatment may make surgical intervention unnecessary." But the calling in of the surgeon should never be too long delayed. See what has been accomplished by early recognition and earlier intervention in the case of appendicitis, gastric and duodenal ulcer, cancer of the breast, the operative treatment of fractures, various forms of infection, etc. As has been well said, "Surgery should always be a last resort, but never a late one." To the intelligent discrimination and good judgment of the family doctor must be left the decision of this most important, and for the patient momentous, question.

Attention has already been called to the fact, and it is generally recognized, that the importance and responsibility of the family physician are, as a rule, not only underestimated, but inadequately compensated. There are reasons for this which will bear further consideration. During the recent period of remarkable surgical advance which was a direct result of the acceptance of the teachings of living pathology, and of the discoveries made in experimental laboratories,

progressive surgeons attained an ability in early diagnosis distinctly superior to that of less progressive internists, who were still too largely influenced by post-mortem pathology, and whose code of diagnostic signs and symptoms led but too often to a pre-mortem recognition of a previously curable lesion. Thus a surgical consultation came to be recognized in certain border line affections, as being of increasing value to the patient. Until more recently, this led to a border line warfare over what was and was not a medical or surgical ailment, with the result that physicians sometimes withheld their patients too long from surgical help, and surgeons became too prone to appropriate everything that came their way. Perhaps more potent still in the working of injustice to patients, has been the deplorable conditions that have affected medical education. If all of the individuals who in recent years have become possessed of the degree of Doctor of Medicine had been properly trained, there still would have been an over-production of practitioners. As it is, we have not only this plethora of doctors, but a still greater evil in that a large proportion of American physicians and so-called surgeons of today, are insufficiently trained in modern methods, and are perforce unfit properly to practice their profession.

Coupled with the unavoidable competition for the relatively few patients, has come the increased cost of living, and of practice itself. The poorly prepared have to compete with the well-prepared. Each feels that his profession owes him a comfortable living for himself and his family, and in desperation, ideals and even honesty itself at times have been forgotten.

There have been evolved two types of practitioners, one which considers itself a servant of each patient seeking only to further that individual's welfare, the other which looks upon the patient as so much commercial material to be, on the whole, treated as well as possible because that is more profitable but nevertheless to be manipulated for the greatest material gain. To the credit of the profession be it said that the former, without doubt, includes by far the larger number of the profession.

By no means is it supposed that competent and incompetent, safe and dangerous practitioners may thus be separated as sheep from goats. Such an hypothetical classification will, however, simplify a presentation of certain existing conditions without affecting materially the validity of the argument. Moreover, it is assumed that every conscientious practitioner, whatever be his specialty, has long since recognized that no one can be all things therapeutically. Indeed, if one keeps constantly well posted in the essentials of any specialty, particularly internal medicine or general surgery, one can have neither the time nor the desire to attempt the impossible, and become a general all-around specialist. In no sense is this a criticism of the stalwart country

doctor who has to meet all sorts of crises single-handed, and who does it wonderfully well.

Suppose, for the sake of a concrete example, that some one of us is suffering from a surgical ailment and that this individual, you or I, seeks the advice of a physician. At once there has been demanded of this doctor three vital questions: he is in honor bound to see determined, to the best interests of his patient, a diagnosis, the nature of the corrective therapy indicated, and a selection of the one best qualified to undertake it.

In the great majority of cases, this physician is or should be able to recognize the ailment as surgical, even if its exact nature is indeterminate. Grant, if you will, that the affection is obscure and a medical consultation appears advisable. Who shall be called? Would we, you and I, desire more the best available diagnostician, or the one who will directly or indirectly recompense our doctor for this favor, charging us enough extra to make this commission profitable to all but the one most concerned?

With or without this consultation, a surgeon remains to be chosen. Shall our doctor who may dabble in surgery hold on to us for the fee, when he knows or should know, that he is incompetent? Or shall he refer us to the man who pays the highest straight rebate? Perhaps we may have unconsciously too great delicacy for such crude methods and would prefer, in our ignorance, that they be tempered by disguise as long as we have to be shorn. Our doctor surgically undertrained might be chosen as an assistant, or an anesthetist, or the surgeon might say to him later "My fee is (x) dollars, make any settlement you can, and keep the difference." Or possibly, do we think, you and I, that we should prefer the surgeon who is most certain, all things considered, to get the best results? The excuse is made that the best available man also pays the best rebate.

The moral deterioration that attends rebating, both in the giver and the receiver, is stronger testimony against this debasing practice than all the other ethical arguments that can be advanced. It makes both unfit properly to practice what we like to believe is the highest of professions. Worse from the patient's standpoint than the inevitably increased expense, is the real danger of ill advised, poorly executed and often wantonly needless surgery, for which the large army of neurasthenics becomes an easy prey.

So much for the diagnosis and selection of a surgeon. There comes next the physician's duty at the time of operation. Whenever possible, he should be with the patient, first because if his relations to his patient are as they should be it will give that individual increased confidence, and a sense of security and comfort, thus improving the chances, because as insisted upon by Crile, the psychic influence upon anesthesia and convalescence is a factor too significant to be neglected. Second, because no physician can afford,

for his own sake, to miss any opportunity to control his diagnosis, and visualization of the underlying pathological conditions, by seeing for himself the actual state disclosed at operation, not if he is conscientious in his desire to improve in power of diagnosis, in more accurate interpretation of abnormal physiology, and thereby in rational therapy. Moreover, he should be present to aid the surgeon when occasion demands, in interpreting the patient's history, helping greatly thereby in a determination of the wisest measures to be undertaken. He can thus the more intelligently render service in the after-care, which the purely operative type of surgeon has too readily relegated to other hands as unessential or superfluous, a practice that cannot be too strongly condemned. Too frequently it has been inefficacious, chiefly because both physician and surgeon were too self-satisfied to learn what was essential.

There never should be any contest as to whether an affection is or is not purely surgical, and in no case has an intelligent coöperation been productive of other than gain to the patient. No case is purely surgical, when the physician and surgeon as well are so to speak, on to their job and have a true professional interest in their patient. This kind of attention can never be adequately paid for in money.

The erroneous notion that surgery is principally carpenter work, and limited to the operating table, finds two general exceptions, both lay and professional. The operating room assuredly is the place where a surgeon's judgment and stamina may be put to the most spectacular test, and it may be the period of his gravest responsibility. His judgment, if it is not based upon sound pathological and physiological foundations, may lead him into fatal error, no matter what his pluck may be, and both may be subjected to the severest test in a given case, in refusing operative intervention. His responsibility to the patient lasts so long as the untoward effects of his therapy persist and that sometimes means a very long time; it may be a life time. An appreciation of the full significance of this thought, ought at all times to sober the judgment and restrain the enthusiasm of the would-be operator.

During the period of operative recovery, that is, until the wounds have healed, and while the patient is essentially surgical, the physician can be of great help to the patient by timely personal attention and encouragement, and by keeping in touch with progress be enabled to render the greatest possible assistance during that more protracted, and frequently most distressing period after leaving the hospital, and before recovery is complete, a period that frequently follows even trivial operations and the most perfect healing. If the encouragement and support which a physician may give in case of any purely surgical complication may be of value to the sick, his aid to both patient and surgeon when some compli-

cation arises which is medical, may be indispensable. Up to the time a patient ceases to be surgical, the physician must rely upon surgical experience to dominate the treatment, but at that time he should take full charge, and by previous personal observation should be in a position to direct the after care to the utmost advantage.

Having kept from the beginning in touch with each detail, a physician who understands the processes of physical and psychic repair, as well as they can be understood, is in a position to supplement surgery, and frequently is able not only to hasten a return to normal, but may even be directly instrumental in making such a recovery possible. Here come tests of patience that try the soul, not to be dodged with flimsy excuses, but to be met as part of the day's work. Frequently a change is indicated, and always is there a temptation to advise it in order to escape from these forlorn nervous beings, who haunt one's dreams when they are not complaining in person.

Many such individuals find their way to a sanatorium, an easy haven, but too often like other easy things, rather harmful than otherwise, not that there do not exist good sanatoria, nor that certain individuals would not be benefitted by proper sanatorium treatment. These institutions are all expensive, usually beyond the possibility of many patients, and many who can afford such luxury had perhaps better learn self-control elsewhere.

Intelligent advice and encouragement, physical, mental and moral, can be given almost anywhere by the well-informed family doctor, and this is frequently all that is needed by surgical cases, with the ever available assistance of good Father Time.

The question of fees has always to be considered, and frequently the statements of the family physician are the sole source of information upon which they are based. Surgical fees may seem out of all proportion to the services rendered, and to our shame be it said, that too often this is true. On the other hand, a surgeon is paid not merely for the judgment, skill and responsibility involved in a particular operation, but rather for his established ability to recognize and to cope with the unexpected. It has been said that it is always the unexpected that happens. How true this is in surgery, and how often it happens that when outwardly an operation which promises to be simplicity itself, once started, may disclose conditions that tax to the utmost the most resourceful. The temperament and training represented in a good surgeon deserve compensation, usually in excess of the returns. The physician, too, is wont to complain that he is underpaid. This is no doubt true in the majority of cases. If he makes an early diagnosis and stands by his patient for the patient's sake, manifestly he is entitled to generous con-

sideration. The surgeon should make it his duty to see that he gets it, first by not robbing the patient and then by seeing that that individual actually understands the personal value of the services rendered by the physician. No rebates, combined bills or mutual understandings are necessary. Frankness and square dealing alone will suffice to right most of these evils.

Do not gather from the foregoing that the speaker has any desire in any way harshly to criticise any special individual or group of individuals. It is part of our duty to recognize facts as they are and openly to consider them and their bearing upon the public health. One frequently hears expressions of surprise because medical men as a body appear to exert so little influence upon public opinion. Is it any wonder, when we know that there are good and sufficient reasons why we do not always deserve public confidence? As a profession we stand convicted before the public, no matter what our pleas may be as individuals. It is our duty to find and to apply a cure for these ills, as well as others affecting the public health of the body politic. Fortunately, the diagnosis is easy and a specific remedy is at hand.

Insufficient education and training have made possible the tremendous over-production of poorly equipped individuals technically M.D.'s, potentially charlatans. The public is rapidly awakening to conditions, and will presently deal drastically with us if we do not clean house ourselves.

The cure is to come by enforcing the highest standards in medical ethics, in medical education, advanced requirements for admission to medical schools, rigid adherence to equally high standards for graduation, and it is to be devoutly hoped, an added hospital year as a prerequisite to practice.

The obligation of medical faculties is not merely to advertise university methods of education, but to see to it that their promises are literally fulfilled. Students should be given instruction not only in the most modern methods as applied to all branches of medical art and science, but should also be shown the most exact examples of professional honor. Morality can be taught by nothing as well as by example. Possibly the most malign influence exerted on medical students at the present time is the ubiquitous commercialism manifested, however unwittingly, by their professors, who neglect their moral obligations to their students and to investigation, in order to make money or political capital out of their patients, or of opportunities that come to them because of the very positions which they are holding, and by this very fact perhaps, keeping out of the same positions probably more capable men, who would stand up to sane and honest idealism.

It is our duty, yours and mine, to see that medical education is limited to those institutions that

can give proper opportunities to their faculties and students, and who have sufficient backbone to hold both strictly to account. We should also strive to get public sentiment aroused in support of this necessary advance.

The signs of the times are fortunately most encouraging, a widespread increased intelligent interest is being taken in educational problems. Particularly is this true of medical education, with a resulting increase in moral and material support. Encouraging too is the growing number of medical schools that are fighting, against tremendous odds, to modernize their equipment and methods of instruction, to foster research and idealism, and to turn out only such graduates as any one of us might welcome in case of sickness, and to whom we can cheerfully intrust the future maintenance of the highest medical standards, and the progress of medical science and practice in these United States.

ANAPHYLAXIS IN ITS RELATIONS TO CLINICAL MEDICINE.*

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TO the majority of medical men the term anaphylaxis, if it means anything at all, usually stands for some rather interesting laboratory experiments with guinea pigs, or else it suggests a vague recollection of some connection between antitoxin and sudden death. Speedily and very surely, however, the phenomenon of anaphylaxis is coming to assume a pregnant significance for the clinician. In its various aspects it relates to preventive as well as to curative medicine. Its processes are involved not only in disease of infectious origin, but in diseases of the digestive and respiratory tracts, due to apparently far different causes. The connection between these several conditions of markedly dissimilar etiology, is closer, nevertheless, than would appear at first sight. Through this new phase of immunity, the proteins are beginning to assume a new interest in the varied manifestations they exhibit when introduced through different channels into the animal body.

Anaphylaxis, or as it is more properly termed, hypersensitiveness, is a changed reacting power of the body to protein brought about by a previous introduction of the same or closely related protein. It is a parenteral digestion of protein—that is, a digestion outside the gastro-intestinal canal—giving rise to symptoms of intoxication of varying intensity. The acute and fatal intoxication following the intravenous or intraperito-

neal injection of a protein substance into a guinea pig which has been previously similarly treated is an illustration of hypersensitiveness or anaphylaxis raised to its highest known power. To give a clearer understanding of the subject a typical animal experiment might be described:—A guinea-pig receives an injection of a fraction of a milligram of egg white under the skin, into the peritoneal cavity or into a vein. Beyond whatever slight shock the operation may produce, the animal exhibits no abnormal symptoms. The injection is quite without demonstrable effect. That the body has acquired a new reactivity to a similar injection is shown by a second parenteral introduction of the same protein after an interval of ten or twelve days or more. The injection of so small a quantity as a few milligrams brings on a complex of symptoms both striking and unique, the rapidity of their sequence depending upon the portal of entry. In a short time—a few seconds if the injection is intravenous, a few minutes if intraperitoneal—the animal becomes restless, scratches its nose, then exhibits signs of marked respiratory disturbance, consisting of periods of dyspnea and apnea. The body temperature progressively falls from the onset of the attack. The whole sequence to death from asphyxiation is a matter of a few minutes. Further, the blood is deeply cyanotic and its clotting time is retarded. Upon section the heart is found to be still beating, though usually arrhythmically, giving evidence of heart block. Frequently punctate hemorrhages are present. The lungs, however, present the most characteristic picture. They are always in a state of maximum inspiration, forming a cast of the chest cavity and at times contain petechial hemorrhages. When introduced by way of the gastro-intestinal canal, if the digestive tract is in a perfectly normal condition, proteins fail to produce sensitizing and intoxicating symptoms. The reason is probably to be found in the fact that in the processes of gastric and pancreatic digestion the proteins are split into chemical substances having a much smaller molecule, and, therefore, are absorbed from the intestine in the form of simple derivatives, such as amino acids, which have no sensitizing or intoxicating properties.

At present the most reasonable theory put forward to explain the mechanism of anaphylactic processes is, in its essentials, as follows: The introduction of protein substances into the body by any parenteral route, that is by any other way than through the gastro-intestinal tract, elicits from the body a response in the form of a production of anti- or immune bodies. These appear to have the nature of a proteolytic ferment. A period of eight days or more must elapse before any hypersensitiveness can be demonstrated. At the end of this period, if the same protein substance be again introduced into the body in a like manner, it is attacked by the

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ferment-like antibody and digested into simple substances, some of which are pre-eminently poisonous. This parenteral digestion is accomplished almost instantaneously. In a few seconds, and at most in a few minutes, the toxic stage is reached and at this point the poisonous digestive products attack the body cells and an acute intoxication results. The sensitization, therefore, is produced by the whole or a part of the protein molecule, the intoxication by simple derivatives of the protein arising in its cleavage by the specific ferment elaborated as a result of sensitization. This condition of induced hypersensitiveness is of long duration, and may continue throughout life.

As we ascend in the scale of animal life, the aspects of anaphylaxis change. The acute respiratory symptoms are greatly modified, this modification apparently being due to differences in the development of the bronchial musculature. The manifestations of anaphylaxis in man are of a very different nature. They vary from scarcely noticeable symptoms to the most profound general bodily disturbances. They are so many and so varied in character that it will be better to consider some of the more important of them separately. The manifestations in man best known at present are those following the injection of antitoxic and other sera, and here the symptoms are caused by the native proteins of the sera and not by the antitoxic substances they contain. These manifestations constitute the condition known as serum disease which has been so ably studied and described by von Pirquet and Shick.

I. *Antitoxic Sera.* The reactions provoked by the administration of such a foreign serum as antitoxic horse serum may be divided into three groups:—1. The injection is followed by an immediate reaction; 2. The first injection produces no appreciable effect, but a secondary reaction appears after six, eight or nine days, or even later; 3. The first injection is without primary effect, but a re-injection made after an interval of at least eight days may call forth an immediate and severe reaction.

Group 1. When the effect of a primary serum injection is immediate, the cause is to be looked for in a toxic constituent or constituents of the serum. This is best illustrated by the injection of heterologous sera in animals, particularly eel serum. This phenomenon is not well understood and has only a slight bearing here. On the other hand, the initial injection of an intrinsically non-toxic serum, such as horse serum, may produce acute and somewhat grave disturbances when injected into man. Alarming symptoms, including collapse and in a few cases even death, sometimes follow the therapeutic injection of antitoxin. Undoubtedly this condition of susceptibility to the serum proteins must be due to a previous unsuspected sensitization. How this sensitization is brought about in such cases is

not at present understood. Asthmatic individuals and those who exhibit asthmatic tendencies in the neighborhood of horses are apparently particularly prone to such a reaction. Such individuals may be so sensitive as to render the administration of curative sera a hazardous procedure. Hence, in giving antitoxin, particular attention should be given to the existence of such tendencies. It is possible that a reliable diagnostic test will be devised by which it will be possible to detect any idiosyncrasy contraindicating the use of a serum.

Group 2. In the great majority of cases where antitoxin is given there are no immediate symptoms other than those due to the progress or abatement of the disease against which the treatment is directed. After a period of eight days or more, however, some of the manifestations of serum disease may appear. They consist of urticariā, fever, edema, headache, pains in the joints, albuminuria, leucopenia. They vary in intensity, and while they may be disagreeable and troublesome, are rarely of serious consequence.

Group 3. The immediate reaction following a second dose of antitoxic serum if given eight days or more after the first dose, is better understood. It is strictly analogous to the anaphylactic intoxication which has been so thoroughly observed in animals. In man there may be redness and swelling at the site of injection, combined with the symptoms discussed under group 2. While the severity of the reaction may be alarming, yet its seriousness seems to have been overrated. If the serum is to be given, it should be first ascertained whether or not the patient had previously received a prophylactic or immunizing dose of serum, no matter how remote the time of such treatment. In such a case the second injection should be by the subcutaneous route. The greatest danger incident to the administration of antitoxic sera, however, lies in the first injection in individuals with hypersensitive idiosyncrasies.

II. *Smallpox Vaccination.* The symptom-complex of cowpox vaccination depends upon an induced hypersensitiveness and in many respects is comparable to that of serum disease. Beyond the local trauma a first vaccination produces no immediate reaction. On the third or fourth day a small red papula appears. This marks the beginning of the reaction. The subsequent symptoms are too well known to require discussion here. If a second vaccination be performed while the individual is still sensitive, the onset of the symptoms is immediate. There are no dangers of an anaphylactic nature in the practice of cowpox vaccination.

III. *Hay Fever.* Hay fever, rose colds and allied conditions are undoubtedly due to a localized anaphylactic intoxication dependent upon a previous sensitization with the proteins of pollen. The access of pollen from various sources to the mucous membranes of the respiratory tract renders some individuals so hypersensitive that a

subsequent contact gives rise to the well known reaction. A person who is sensitive to grass pollen usually fails to react to the pollen of ragweed. This would explain the different types of the disease such as rose colds or vernal type, and the attacks of late summer. The asthmatic symptoms exhibited by so many hay fever patients may be analogous to the respiratory disturbance in anaphylactic animals. Various other asthmatic conditions probably have a similar etiology. It appears reasonable to hope that it may be possible to immunize persons to pollen protein and thus prevent a recurrence of the disease.

IV. *Urticaria*. It begins to appear probable that many urticarial eruptions are of an anaphylactic nature. This is seen in serum disease. The rashes developing after the eating of shell fish, of strawberries and buckwheat, to mention the most striking illustrations, as well as satinwood dermatitis, may be due to a local toxic action caused by a previous sensitization. It is an observation of great interest that some individuals exhibiting such idiosyncrasies show a local reaction when extracts of these various substances are applied to the skin or conjunctiva. This sensitiveness may be so great that a minute quantity of the particular food material will provoke severe general symptoms. These conditions offer an interesting field for research. The application of the methods of anaphylactic investigation may serve to explain their etiology and symptomatology and to enable one to provide a prophylactic treatment.

V. *Exanthemata*. The rashes of measles, scarlet fever, chickenpox, the specific macular eruption of syphilis, may all be manifestations of a localized anaphylactic reaction. The protein of the disease producing virus comes into contact with highly activated antibodies in the dermal cells, and is digested. An irritant poison is thus liberated which causes the characteristic local inflammation. These skin eruptions are comparable to the local cutaneous reactions following the use of mallein, tuberculin, luetin and some of the bacterial vaccines.

VI. *Bacterial Vaccines*. When extracts or suspensions of bacteria are injected into or under the skin of individuals who are or have been infected with the corresponding organisms, a localized inflammatory reaction may appear at the point of injection. This may be also accompanied by a general bodily disturbance and by changes at the site of infection. The production of these local, general and focal reactions is now utilized in a diagnostic way and may serve to confirm a physical examination or to reveal the presence of a latent or occult infection. The infecting bacteria, by their protein constituents, call forth in the body a production of antibodies which diffuse through all the tissues. These immune or antibodies may exist at the infected focus, they may circulate in the blood and they may be pres-

ent in the various tissue cells. All of the tissues become sensitized and the introduction of a specific antigen in the form of bacterial extracts or emulsions results in a splitting of the protein thus introduced and the consequent liberation of the poison giving rise to the various toxic manifestations. The local redness and swelling provoked by the subcutaneous injection of mallein (an extract of the bacillus of glanders) has long been considered as having a positive diagnostic value. Bacterial vaccines are coming to have a diagnostic as well as a therapeutic use, since their administration, as might be expected, may elicit one or more of the three specific reactions, and, as a rule, these are exhibited only when the infecting and injected organisms are the same. There are exceptions, however, as it has been found that normal individuals may react to a prophylactic inoculation with typhoid vaccine. It may be possible that the substance of the typhoid bacillus is toxic in itself, or else that the individuals reacting have been unconsciously rendered hypersensitive by a previous implantation, or a low-grade, and, therefore, unrecognized typhoid infection.

VII. *Tuberculosis*. The use of tuberculin as a diagnostic measure is perhaps the best known example of the utilization of the hypersensitive condition for establishing the presence of infection. The cutaneous reaction of von Pirquet, the percutaneous of Moro, the ophthalmic reaction of Wolff-Eisner and Calmette, and the intradermic test of Mantoux are based upon a local tissue sensitization. The application of tuberculin to the skin usually produces nothing more than the local symptoms. If the tuberculin is absorbed into the lymphatic or blood circulation a general reaction may follow in the form of fever, malaise, et cetera, combined with increased inflammation at the focus of infection. The subcutaneous injection of tuberculin may produce decidedly harmful results in a tuberculous individual and rather than submit their patients to its discomfort and dangers the more careful clinicians are advocating its discontinuance as a diagnostic procedure and rely solely upon the cutaneous or intradermic tests. In the therapeutic administration of tubercle products the same factors operate and it is now the best practice to so gauge the dose that the threshold of reaction is never reached. These tests exemplify the long persistence of the hypersensitive condition. It should be borne in mind that an infection may render an individual sensitive for a long period of years and that, therefore, a positive tuberculin reaction may indicate a healed or latent tuberculosis of long standing as well as the presence of an active process. It should be further remembered that as far as we know, skin sensitiveness to tuberculin can be produced only by a tuberculous lesion and not by previous injection of tuberculin.

VIII. *Infectious Diseases*. The phenomena of anaphylaxis are assuming a particular signifi-

cance in their application to the various manifestations of bacterial infections. This application might be briefly sketched somewhat as follows: A pathogenic micro-organism invades the body and is met by the normal defensive substances of the tissues. If the virulence of the organism is not too great, or if the defensive substances are sufficiently potent, no infection results. A lowered resistance, however, may enable the bacteria to multiply, and, at the same time, some of them are dissolved and their protein constituents liberated, producing sensitization. The incubation period would represent the struggle between the invaders and the defenders and during this time sensitization is being induced. At the end of this period, the bacteria are present in large numbers and may be distributed more or less throughout the body. At the same time the tissues have acquired a degree of sensitization which results in the splitting of the bacterial proteins and in this cleavage a poison is set free in sufficient amounts to cause fever and other signs of intoxication. Local tissue changes such as ulceration, rashes, et cetera, may be due to an irritant action of the poison on the tissue cells. The varied nature of the symptoms in different infectious diseases may be due to the selective affinities shown by certain bacteria for particular tissues, to the degree of their dissemination, to their power of inducing sensitization, or perhaps to their individual chemical nature.

Fever is coming to be looked upon as a symptom of an anaphylactic process. It can be due to the action of the poison liberated from bacterial proteins by specific lytic antibodies or it may result from poisons arising in the destruction of body proteins by pathological tissue changes. The crisis in pneumonia is a fulminating reaction between bacteria and antibodies. Recovery by lysis means the gradual ascendency of the acquired immune substances over the vitality of the bacteria—they are digested faster than they can multiply, and the disease abates. The subsequent immunity to a new infection in such cases may be due to the presence of a degree of sensitiveness which renders microbial infection impossible. There are many phases of infectious diseases which our theories of anaphylaxis fail to explain, but the theories are young and undeveloped and it is not unreasonable to hope that, as they expand, we shall have a new and reliable basis for solving many of the problems involved in bacterial disease. If we are to find in anaphylactic processes a true basis for analyzing the phenomenon of fever, then the importance of the study of this new phase of immunity becomes apparent.

IX. *Idiosyncrasies to Food-Things.* The marked idiosyncrasies to certain food-stuffs exhibited by many individuals have long puzzled the clinician and have begged explanation. It is quite likely that these conditions, too, are amenable to analysis from an anaphylactic viewpoint.

The most striking of these individual peculiarities is the non-tolerance exhibited to eggs, milk, cheese, veal, pork, lamb, buckwheat and various shell fish. The symptoms following the ingestion of these substances consist of erythema, urticaria, inflammation of the mucous membranes, such as gastro-intestinal disturbances as vomiting and diarrhoea, and the usual signs of general intoxication. Their appearance may be rapid and their severity often alarming. It is interesting to note that this reaction is usually limited in any individual to a single food-stuff, and occurs only when the particular aliment is included in the diet. The low fever and toxic symptoms seen in infants subsequent to a change in diet undoubtedly have the same origin and frequently these symptoms disappear when other proteins are substituted for those causing the reaction. Two cases cited by von Pirquet may serve to illustrate such a non-tolerance to food materials. "Landmann gave to a man, who knew his great idiosyncrasy against egg albumin, a very small amount of it, about the size of a pea, on the point of the tongue. After fifteen seconds the man felt a burning, then appeared a swelling of the tongue and an intense edema of the palate and throat; later on, saliva began to flow, the eyes became watery, and there was a burning in the Eustachian tubes, and vomiting. Fifty minutes after the test, the first loose movement took place. Within some hours the patient's bowels moved twelve times, an intense weakness made itself manifest, but gradual recovery set in after eight hours; the attack was then completely over. Landmann tried also the application on the skin. After ten minutes he saw an urticaria-like erythema. In this patient, then a man of thirty-five, a bad result had been noted when he was a year old, after taking soup and egg. In his ninth year the influence of egg albumin on his skin had been noted first." In the second case reported, "H. L. Smith was able to show a typical cutaneous reaction with buckwheat flour. The patient was a man aged forty-five. The first attack was noted at the age of nine years, when, after eating buckwheat cakes, he suffered with a severe urticaria and nausea. Since that time his sensitiveness to buckwheat reached such a degree that he could detect the adulteration of pepper and other spices with buckwheat by his reaction. On W. S. Thayer's advice, the patient was vaccinated with buckwheat. At the same time a vaccination with wheat flour was made, and three non-susceptible persons were vaccinated with both kinds of flour. In this manner the specificity of the patient's reaction to buckwheat flour was shown. Within fifteen minutes after the vaccination, the patient complained of a tired feeling in his chest and of nausea. He began to cough, asthmatic sounds were heard, and there was a rapid pulse which soon became intermittent. A suffusion of the conjunctiva was also noted, together with an erythema mostly on the upper part of the body

intense pruritus, a slight swelling of the face, hands and fingers, giddiness, restlessness, and unsteadiness of gait. At the point of vaccination there was an urticarial wheal the size and shape of a half-dollar piece."

These two cases are good examples of hypersensitiveness to particular proteins. Their greatest significance lies in the fact that the typical symptoms could be elicited by the application of the egg albumin and buckwheat to the skin of the patients. They thus afford a striking support to the view that such idiosyncrasies are anaphylactic in nature.

It has been stated in another part of this paper that when introduced by way of the gastro-intestinal canal, if the digestive tract is in a perfectly normal condition, proteins fail to produce sensitizing and intoxicating symptoms. A sharp distinction is purposely made here between an *apparently* normal and a *perfectly* normal condition. It is now known that egg albumin and other proteins, when taken by the mouth, may pass through the stomach into the intestines in an unchanged condition. Their presence in the gut is the only evidence of gastric or pancreatic insufficiency. It is probable that other proteins are properly digested and that the insufficiency is exhibited to a single protein. It has also been shown that whole or partially digested proteins may be absorbed from the intestine. Their passage into the lymphatic circulation indicates a changed and therefore abnormal absorptive power of the intestinal mucosa, which may be brought about by tissue changes which are not apparent in any other way. If natural proteins enter the general circulation, then it would be expected, according to the theory of anaphylaxis, that the body would become sensitized by this protein and a subsequent ingestion of the same protein, if the digestive tract were still or again in a similar condition, would result in an intoxication. The hypersensitiveness of the skin and mucous membranes in such cases lend weight to such a view.

The importance of such a conception is obvious. By applying various proteins from food-stuffs to the skin, we may detect idiosyncrasies, and by eliminating these foods from the diet subsequent toxic attacks may be avoided. It may be possible to devise means for immunizing individuals against the particular protein to which they display a non-tolerance, but the way to this end is not yet clear. The application of these new principles are being extended to include and elucidate many intoxications of intestinal origin. It may be that these toxic conditions may be due to an initial absorption of sensitizing proteins and a subsequent absorption of, and consequent intoxication by the same protein, and, therefore, are not entirely referable to an absorption of preformed poisonous substances elaborated by putrefactive processes in the intestines.

Those so-called auto-intoxications in which none of the chemical indicators of putrefaction are to be found in the urine, may belong to this class.

In order to leave you with a clearer understanding of the new aspects afforded by the theory of anaphylaxis, it may be well to briefly recapitulate some of its applications. It has given us a new insight into the various sequelæ of antitoxin administration and points out the possible dangers incident upon its use; it elucidates the processes involved in cowpox vaccination and the use of bacterial vaccines; it gives a reasonable basis for understanding such conditions as hay fever, asthma, urticaria, and the exanthemata; it serves to explain the sensitiveness shown by tuberculous individuals and thus to establish an intelligent rationale for the diagnostic and therapeutic use of tuberculin; it promises to afford a new conception of the various manifestations of bacterial activity in infectious diseases; it may solve the problem of fever; it presents idiosyncrasies to food, and also the intestinal intoxications to us in a new light. While it is possible that its true value is not yet wholly realized, yet the importance of its application to diagnosis, prophylaxis and therapeutics must surely impress you.

A consideration of the details and varied applications of anaphylactic phenomena reveals an almost limitless field for speculation and experiment. The mechanism of hypersensitiveness can best be studied and analyzed by means of animal experimentation in the laboratory, but the observations of the clinician are necessary in order to gain a clear conception of the meaning of these processes and their significance in practical medicine.

THE PRESENT STATUS OF VACCINE (BACTERINS) THERAPEUTICS IN PURULENT DISEASES OF THE EAR.*

By RENÉ H. HUVELLE, M.D.,

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IN the last few years there has been a great deal of attention drawn to vaccines, much work has been accomplished and much variance of opinion has resulted, especially as to its value in the treatment of purulent diseases of the ear. Although vaccine therapy promises much for the future, unfortunately it is far from being universally successful; yet, there has been sufficient success to cause the question to arise in the minds of many of the medical profession, whether or not, immunity by bacterial vaccines is actually valuable and practical or whether this method of therapeutics is still a matter of experimentation. This is a field opened to us for

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thought and scientific research which is practically limitless.

Many changes have taken place in the treatment of purulent diseases. It seems that we have now arrived at a period where it is found necessary in combating infection, to increase the efficiency of nature's protective forces, thereby limiting the extension and inhibiting the activity of the infecting bacteria. In bacterial vaccines, it would seem as if a valuable aid has been placed in the hands of physicians in the treatment of localized infections, and, that it has not become more generally used is undoubtedly due to the fact that many are unfamiliar with the proper mode of application, or after its first trial, failure has resulted and further trial is considered useless.

The object of vaccine therapy is the production of an active immunity to the specific bacteria concerned, that is, to assist nature in the production of antibodies in order to effect a destruction of the bacteria and the neutralization of their toxins, and thus cut short the illness.

This is accomplished by the administration of dead cultures of the bacteria causing the infection, which stimulate the body to increase its formation of antibodies.

The body itself must form its own antibodies—that is, an active immunity must be brought about, which usually takes from three to four days. During this time, while immunity is being developed, the resisting powers of the body are not increased but are often diminished. It is often noticed, while this is occurring, the discharge from the ears is increased in amount. In furunculosis, if a furuncle has previously existed a day or so, it rapidly comes to a "head;" immunity is not being established for this furuncle but for subsequent ones.

This active immunity is obtained by vaccines, bacterins. However, we must bear in mind the fundamental distinction between active and passive immunity. In the use of passive immunity in the cure of disease, aid to the patient coming from without, the mediation of a second animal is required; the immediate protection may be great, but it is temporary. Diphtheria is one disease in which passive immunity has proved its worth.

In the treatment of bacterial diseases by vaccine therapy, observations indicate that autogenous vaccines are always desirable, in preference to stock vaccines. This preference seems to be due to the fact that the virulence of the organisms making up the vaccine, approaches as closely as possible the virulence of the organisms producing the disease. In order to explain this, contrast a virulent furuncle and an acne pustule which are often caused by the same organism, staphylococcus albus; yet, a vaccine made from the staphylococcus producing the acne pustule, would not be expected to do the patient with the virulent

furuncle much good, whereas, the vaccine made from the staphylococcus of the furuncle, would be positive in its beneficial effect on the patient suffering with a furuncle.

In this method of therapeusis, it is very essential that the vaccine employed should be from pure cultures; especial care must be taken to avoid introducing some of the spore-bearing organisms, such as tetanus.

Success in this method of treatment presupposes that the patient is not overwhelmed with poison; the patient must respond to the added stimulation in order to increase the bacterial destruction which must not be rapid or excessive, lest efforts to cure do harm through hyper-intoxication.

A mistake, I believe, is made in an endeavor to obtain a rapid cure by administering a large dose of vaccine at the first injection, increasing the dose too rapidly and injecting the vaccine too often.

Vaccines, like any other foreign substances, in overdose are not tolerated by the body. It will be a source of distress to the patient and a disappointment to the doctor.

Vaccines will do their best work by beginning with a small dose and gradually increasing the size of the dose every other day. In this way, the body can tolerate the treatment without experiencing any ill effects.

As to the initial dose, how much increased and how often given, depends entirely upon whether the doctor is a good clinical observer, has a general practical knowledge of the principles of active immunization and is willing to devote sufficient time to a careful observation of his patient, over whom he must have control.

When the vaccine is standardized to 500 millions bacteria to the c. c., in staphylococcus infection, I usually begin with $\frac{1}{4}$ c. c. as the initial dose. This is increased $\frac{1}{8}$ c. c. every other day, until 1 c. c. is reached, which latter dose is given about five times every other day. At the end of this time one can judge whether the vaccine is to be effectual or not.

In streptococcus infection it is better to begin with 25 millions bacteria as the initial dose and increase 10 millions. As a rule, three or four injections are all that is necessary in infections due to streptococci. The injections are made in either arm, under aseptic precautions.

The usual regular treatment is given, as, in the use of bacterial vaccines we have only an aid—it is not to be considered as an absolute specific. The general health of the patient is looked after, and the bowels are kept regular. By following such a method, in many instances, rapid recovery occurs; the patients will complain of no ill effects, but will often say their general health is better, appetite is good, and that they are well satisfied.

Contra-indications to the use of vaccines are:

- I. Acute constitutional diseases, as septicæmia, pyemia and sapremia.
- II. Continued high fever.
- III. Nephritis.

The consensus of opinion of the results of various infections is that in staphylococcus infections, vaccines give the best results. This may be due to the fact that it is not such a virulent organism, and that the infection in these cases tends to become localized. In streptococcus diseases, the results have been far less brilliant, but still encouraging enough to warrant their further use.

In discharging ears due to the tubercle bacillus, pseudodiphtheria and pneumococcus the results have not been very satisfactory; probably because the opportunities of testing vaccines in such cases are not very common. The bacillus Xerosis is very commonly found in chronic purulent otitis media; occasionally it is found as the only organism in the discharge. Vaccines made from such pure cultures are often beneficial as an aid in the treatment.

The bacillus pyocyaneus, being of low pathogenic power, the results are usually negative.

The method employed by me in obtaining swabs for culture, and the laboratory technic used by Dr. L. W. Strong, Pathologist to the Manhattan Eye, Ear and Throat Hospital, New York, will be described later.

As the usefulness of vaccines (bacterins) is limited to locally acute, subacute and chronic infections, purulent otitis media seems a condition offering a good opportunity to test this method of treatment because the condition is local, the offending organisms can easily be secured, if present, and the results of the treatment can be readily observed.

CHRONIC PURULENT OTITIS MEDIA.

The results of vaccine treatment in this condition are varied. Some observers report wonderful results and cures, others no results and still others some improvement. In most cases of chronic suppurative otitis media there is, in all probability, an area of necrosed bone. This necrosis progresses until the resisting powers of the body are sufficient to check its progress, that is, a line of demarcation is formed. Nature endeavors to remove this dead bone by a slow process of ulceration, taking months to do it. This foreign body can be removed in a few minutes by surgical measures, the radical mastoid operation, provided a very thorough operation is performed.

A certain proportion of the radical mastoid operations are very unsatisfactory, the after-treatment continuing for months or even years, the patient often being in a worse condition than before the operation; in addition to the con-

tinued discharge the hearing in that ear in many of the cases has diminished (at times to total deafness) and there is a possibility of facial paralysis. I do not stand as opposed to the radical mastoid, for there are certain cases that must and always will demand the radical operation. However, as all forms of treatment in this class of cases extend over a long period of time, any measure that offers at least a chance of success, without sacrificing the hearing, and incurring the usual operative risks, ought to be given a trial. In vaccine therapy, if the casual organism is isolated, nature undoubtedly will be stimulated to form a line of demarcation between healthy and dead bone, and, in this way, endeavor to get rid of the necrosed bone.

Dr. E. W. Nagle, of Boston, reports forty cases treated by vaccines, with one failure. In six cases the discharge had existed six months, and it was in this class that the one failure occurred; in the other cases the discharge had existed from one to forty years. I have not been able to find out whether the doctor's cases still remain cured.

Dr. S. J. Kopetsky, of New York, reports six cases with bone necrosis, no cures and one case improved, five cases without bone lesion with four cures and one improved.

Dr. Robert Levy, of Denver, has collected twenty-four cases among his confrères in Colorado, without mastoid involvement, with thirteen cures, six cases improved and five not improved. The usual treatment, such as drainage and irrigation, was given. The doctor does not mention whether there was any necrosed bone in the thirteen cases cured.

I have selected twenty cases of chronic purulent otitis media in the Ear Clinic of Dr. T. Passmore Berens, at the Manhattan Eye, Ear and Throat Hospital, New York City. In these twenty cases the discharge has existed from three years to twenty-three years, the idea being to try the vaccine treatment where there were evidences of granulations or necrosed bone in the middle ear.

The results have been very interesting to me, and, will in a measure, illustrate the difficulties one encounters in treating these chronic cases with vaccines.

In seven cases it was impossible to obtain cultures of pathogenic bacteria after repeated trials. The number of years the discharge has existed in these cases, are: 20, 18, 12, 10, 9, 6 and 4 years. In each case there were undoubted evidences of granulations or rough bone in the middle ear. At first, I thought I was too sterile in my method of obtaining swabs of the secretion, later I would make swabs from the middle ear space as the case presented itself in the clinic, and yet, it was impossible to obtain growths of pathogenic bacteria. The discharge had the appearance of being pus and not a mucous secretion.

Dr. L. W. Strong, pathologist to the Manhat-

tan Eye, Ear and Throat Hospital, New York, believes the soft, flabby granulations are an index of a low grade inflammation, the secretion of which harbor many non-pathogenic bacteria. Whether this secretion is due to the granulations, dead bone or to the fact that the bacteria "have worn themselves out," I trust this point will be brought out in the discussion.

In seven of the cases the cultures contained two or more of the following organisms: staphylococcus, streptococcus, pyocyanus, bacillus xerosis, spore-bearing bacilli and others to such an extent, that it was impossible to tell which predominated in order to use stock vaccines.

In the remaining six cases I was able to use vaccines. In three of these cases staphylococcus were obtained in pure growth, in one bacillus xerosis occurred in pure culture; in the other two the staphylococcus predominated and a stock vaccine of staphylococcus was used.

In these six cases the following uniform results were observed: After the first two or three injections, the discharge would increase in amount for a day or so; it was thick and yellow. The discharge, in two cases, would gradually become sanguinous in the next two or three days; then clear, and after about six to ten injections the ear was dry. The ear would remain dry for about three weeks when a recurrence would occur.

In one case, after the ear was dry for five days, the patient returned with an acute purulent infection of the middle ear and slight mastoid tenderness. I do not believe this was due to the vaccine, as the patient said he had "gotten soap and water in his ear," which may have started the inflammation. The patient objected to further vaccine treatment. The cases were instructed not to use any treatment at home for the ear, and the only other treatment consisted in cleansing the auditory canal in the clinic.

In view of the poor results obtained in the treatment of chronic purulent otitis media, it would seem that vaccine therapy would be thoroughly rational and beneficial, and, perhaps would do more if our knowledge and experience were more extensive. In this class of cases vaccines are valuable as an aid in the treatment, and should be given at regular intervals, suitable to each case. The vaccines should be made fresh in each series, and the intervals during which the ear is dry would be lengthened each time, and, I believe, that within a year or so the ear will be permanently dry, much of course depending upon the chronicity and the extent of the suppurating foci. I expect to make a further report on this later.

SUBACUTE PURULENT OTITIS MEDIA.

Acute purulent otitis media, as a rule, does not afford much of an opportunity to test vaccines, as the urgent symptoms demand imme-

diately attention,—paracentesis. However, at the time of paracentesis, an excellent opportunity is afforded to obtain a swab of the discharge. Most of these cases will show pure growth, from which a vaccine can be made in twenty-four hours. Four or five injections will often be sufficient to cause a cessation of the discharge, depending, of course, upon how long the discharge has existed. It is to be remembered, the earlier the vaccine injections are made after the purulent condition has developed, the better the prognosis, for the inflammation is limited to the mucous membrane, and has not yet penetrated to the deeper tissues and bone.

Various observers recommend different times, after the purulent condition has developed, to begin the vaccine treatment. Personally, provided there are no contra-indications, I do not see why the vaccine treatment cannot be started when the case presents itself. I have had no ill effects from beginning so early. In these cases, the usual treatment is given in addition to the vaccine. There should not be the impression that all that is necessary is to give several injections of vaccine; the patient should be given the usual care and treatment.

Following such a line of treatment, the reports of observers show that three times as many cases were cured in thirty days as would occur without vaccines.

I have collected the reports of two hundred and seventy-four cases of subacute otitis media treated by vaccines. On account of the limited time, I will not go into detail in describing these cases. In a general way, I will say that the staphylococcus occurred in nearly 75% of these; from three to seven injections were made. One hundred and seventy-five were cured. Of the remaining seventy-nine, thirty-five were much improved.

There is not any doubt in my mind that vaccines, if properly used in this class of cases, will abbreviate convalescence. Aside from preventing prolonged suffering, this shortening of the duration of the disease tends to abort the familiar consequences in ears with a history of long-continued suppuration, such as deafness, loss of time at work, great inconvenience, expense and even death. This, in itself, is sufficient to commend the treatment.

POST-OPERATIVE MASTOIDITIS.

Dr. James F. McKernon, of New York, has reported ten cases in which vaccines were used, six of these cases being scarlatina mastoids and four measles. In all these cases the results were most satisfactory. The wounds healed rapidly, the granulation tissues were free of any excessive discharge, firm and solid; there was primary healing of the flaps, a minimum scar and very little depression. The length of time for the mastoid wound and middle ear to heal in these cases was less than is usually the case.

FURUNCULOSIS.

Vaccines are so universally successful in furunculosis that it is not necessary to say much about this disease. I use it whenever it is possible for me to do so. Two or three injections will suffice, as a rule. The staphylococcus is the causative organism. I have often noticed that if a furuncle has existed two or three days previous to the injection of vaccine, this furuncle, after the first injection, will rapidly come to a head, is painful and has to be incised. Immunity is not being established for this furuncle, but for subsequent ones. Furuncles in the canal often recur after being incised, often complicated with general furunculosis, and it is in these cases that vaccines are very efficient. Cure is commonly noticed in from three days to several weeks, depending upon the chronicity of the case.

PERICHONDRITIS OF THE AURICLE.

In perichondritis, of a purulent nature, Dr. J. G. Dwyer, of New York, reports very satisfactory results. In this class of cases pure staphylococcus aureus was isolated. I have tried several cases but the cultures were mixed to such an extent that it was impossible to tell which was the causal organism. However, if all the bacteria are pathogenic, I think a mixed vaccine is indicated.

MENINGITIS.

In meningitis, complicating a purulent ear disease, very little has been accomplished with vaccines.

TECHNIC.

In obtaining swabs for culture, the ear canal or part is carefully cleansed with boric acid and sterile instruments are used to prevent contamination. A sterile swab is used, which is placed in a sterile test-tube and properly labelled.

In chronic otitis media, the swab is made in the deepest part of the tympanic cavity, if possible. In cases where an incision of the tympanic membrane is necessary, a swab is taken just after the paracentesis. In furunculosis a sterile hypodermic syringe can be used, or the furuncle can be incised and a swab made.

The method followed by Dr. L. W. Strong, in the laboratory, consisted in planting the cultures on blood serum and examining them the next day. Where there was an uncontaminated growth of any pathogenic organism, a vaccine was made directly by washing the surface of the culture with sterile salt solution, killing the emulsion at 60 degrees C. for twenty minutes. The preparation was then counted and diluted with salt solution to the proper standard.

In conclusion, I would say that no claim of infallibility for vaccine therapy is made. It should be used intelligently where indicated as an ad-

adjunct to the other recognized methods of treatment. Great care should be taken in the interpretation of clinical results, to avoid overenthusiastic and unwarranted conclusions. As to the length of time immunity is afforded by the use of vaccines, it is yet to be observed. There has been no method devised in the treatment of otitis media which has given as brilliant a promise for the future as vaccine therapy; nor do I believe that vaccines have yet reached their highest state of efficiency.

I wish to take this opportunity to express my sincere thanks to Drs. T. Passmore Berens, S. McCullagh, S. J. Kopetsky, S. N. Roof, J. G. Dwyer, F. H. Bartlett, A. Braun, A. P. Voislowsky, R. N. Disbrow and L. M. Hubby for their valuable suggestions and for referring cases to me.

VACCINE THERAPY IN MEDICINE.*

By T. WOOD CLARKE, A.B., M.D.,

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DURING the ten years since Wright propounded the opsonic theory of disease and explained its application to medicine in the form of the therapeutic methods variously known as immuno-therapy, vaccine-therapy, and bacterin-therapy, an immense literature has accumulated dealing with this new weapon for combatting disease. Some of this literature shows internal evidence of extensive, careful, scientific observation; much more of it is hopelessly scrappy and proves nothing more than the desire on the part of the author to get his name into print. The limited time at my disposal prohibits the discussion of theories or minutiae of technique, and my purpose is rather to bring before you in a brief and somewhat didactic review the present accepted opinion of those best able to judge as to the true value of vaccines in the class of cases which come into the hands of the internist.

It is no exaggeration to say that during the past few years every disease of proved bacterial origin, as well as many of doubtful etiology, has been treated more or less extensively by means of specific vaccines, and for each disease one or more authors has claimed marvelous cures. Some of these have been substantiated by further study; others have been relegated to the scrap heap of coincidental recoveries and over-weening enthusiasm. The general consensus of opinion of the most experienced is that the more chronic the normal course of the disease the more likelihood there is of benefit from immunizing therapy. When one remembers that the production of an artificial immunity is a slow process involving

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weeks or months, it is evident that slight if any results can be expected in the treatment of diseases which normally run their course in a few days. It is not in the acute, severe infections such as septicemia or pneumonia that vaccines are indicated; it is the longer, slower affections as tuberculosis, furunculosis and acne which are found to respond to this form of treatment. In fact, the use of large doses of vaccines in acute cases is probably far more often detrimental than beneficial. Wright has shown that for from one to three days following an injection of even a moderate dose of a vaccine, the immunity of the body to the specific poison is distinctly decreased, and reaches its normal level again only after from five to seven days. A vaccine given during an acute disease, when the body is itself, more or less successfully, exerting every effort to raise its own immunity bodies, when the life of the patient depends upon these bodies being produced before the vital spark is overwhelmed by the toxins, merely adds so much more burden to the already overloaded organism, and, while it can be expected to do no good in the time allotted to it, may, on the contrary, by reducing the resistance while increasing the poison, tilt the vital balance in the wrong direction and kill the patient.

When the disease is of a chronic nature, however, and the character of the case makes it seem justifiable to run the risk of causing temporary harm in order to product ultimate good, the use of the vaccine is theoretically rational, and in many cases has been demonstrated to be practically beneficial.

The first pathological process for which a bacterial vaccine was recommended for therapeutic purpose was tuberculosis. Robert Koch's premature publication in 1890 of the therapeutic use of tuberculin, while it raised tremendous enthusiasm for a time, did great harm to the cause of immuno-therapy. The new medicament was widely used in such enormous doses that the resulting injury to the patients discredited the use of tuberculin, and caused much prejudice against immuno-therapy of all kinds. This prejudice in the light of recent knowledge would seem to be no more justifiable than to condemn the use of strychnine because an overdose of that most valuable drug may kill instead of cure. Since Wright, however, emphasized this point and insisted that the early failures of tuberculin were due to overdosage, students of tuberculosis the world over have been trying tuberculin out on tuberculous patients with what now seems to be encouragingly good results. It is perhaps difficult to say with definiteness how much of the benefit which has accrued to patients with pulmonary tuberculosis during a course of tuberculin therapy is to be credited to the tuberculin and how much should be laid at the door of proper food and hygiene. The uniformity of the opinion of those who have had the greatest experience with tuber-

culin, however, that it is an aid in combating the great white plague, speaks in favor of the new weapon's actual value in the fight against tuberculosis. It is agreed that the treatment should be confined to latent and subacute non-febrile cases and that it should, if possible, be carried out in connection with the usual fresh air treatment. A patient certainly should not be kept in close quarters in a city in order to receive tuberculin, though some excellent results have been obtained by using tuberculin in the cases which owing to family or financial affairs are compelled to remain in the cities.

The usual method of administering tuberculin is to begin with a minute dose usually one one-hundred-thousandth of a milligram of the bacillus emulsion, or one ten-thousandth of a milligram of the bouillon filtrate, and to increase progressively by doubling the dose until from 0.1 to 1.0 gram is administered at a dose, the intervals varying from five to ten days according to the reaction. The ideal procedure is to keep the dose as large as possible below that at which a reaction is produced. The total course of treatment should consume about two years. If a reaction appears after a dose, the treatment should be discontinued until the fever has subsided and the next dose should be reduced to one-half the strength of the offending one.

As to the use of tuberculin in the treatment of tuberculosis of the genito-urinary system, there is some difference of opinion. Some investigators have been unable to obtain benefit from immuno-therapy, while others report most favorably. It is generally agreed that in cases of local tuberculosis of one kidney or the testes, where surgical interference offers a hope of eradicating the disease, tuberculin should not be used to the exclusion of the knife. In inoperable cases as bladder disease or when both kidneys are involved, or as an adjunct to surgical procedures, it may be used to advantage, and in a certain proportion of cases distinct improvement and even apparent recovery has followed a prolonged course of tuberculin. As in pulmonary disease, however, only latent and quiescent cases are amenable to tuberculin treatment. When the patient is febrile, the injections are contraindicated.

The question of the relative value of tuberculin prepared from the organisms of the human and bovine type is still unsettled. Some authors have adopted the use of tuberculin of the bovine type for cases caused by the human type of tubercle bacillus—pulmonary tuberculosis—and tuberculin of the human type in lesions produced by the bovine tubercle bacillus, as bone and joint disease. Such a choice of tuberculin would hardly impress one as either logical or scientific.

A general disease for which bacterial vaccines have proved of inestimable value is typhoid fever. This ailment is of such short duration that but little is to be expected from the use of vaccines

as a therapeutic measure, and their value in curing acute attacks of typhoid fever can hardly be said to be established, although several authors have claimed that by using large doses of the typhoid vaccine early in the disease the duration of the fever may be shortened, and the severity of the symptoms alleviated. As to the value of the vaccine prepared from the typhoid bacillus as a prophylactic, however, the experience of the past few years has offered an abundance of proof. The experience of the British army in India and more recently of our own army have gone far to demonstrate that a prophylactic inoculation with typhoid vaccine makes it quite safe for a soldier to go into the worst typhoid locality. Before the army maneuvers on the Mexican frontier last summer universal antityphoid vaccination was practised upon the troops. The complete freedom of the camps from typhoid fever thoroughly justified the experiment and has led to the order from the War Department that antityphoid vaccination be required of all recruits for the regular army and is strongly recommended to the militia as well. The routine treatment adopted by the United States Army is to give an initial dose of 500,000,000 bacteria, and to follow with doses of 1,000,000,000 ten and twenty days later.

Other uses to which the typhoid vaccine has been put is the prevention of relapse, the combatting of local infections, as bone abscess and cholecystitis, and the cure of typhoid carriers. The vaccine promises much in the difficult problem of dealing with healthy carriers of the typhoid bacillus, and the prevention of this prolific source of typhoid epidemics.

In recent years it has become recognized that most of the cases of pyelitis, cystitis, and simple bacilluria, not due to the gonococcus or tubercle bacillus are the result of the infection of the genito-urinary tract by the bacillus coli communis. In such cases various authors have reported the use of autogenous vaccines made from the colon bacillus grown from the patient's urine. The usual initial dose is 200,000,000 increasing to 1,000,000,000. As there are several strains of the colon bacillus, it is of importance if possible to use autogenous rather than stock vaccines. The results in such cases have been very good, some highly resistant genito-urinary infections having responded in a comparatively short time to this mode of treatment. In many cases of genito-urinary tuberculosis much of the distress is due less to the primary lesion than to a secondary infection with the colon bacillus. In such cases, injection of the colon vaccine, while of course not curing the tuberculosis has been found to add greatly to the patient's comfort. In such cases a colon vaccine may well be given in conjunction with the tuberculin inoculations.

The bacterins made from the pyogenic cocci, especially of the staphylococci have perhaps given the greatest satisfaction to the practitioner of any of those of which we are speaking. That is

especially true in the treatment of furuncles and carbuncles. The good results obtained in these diseases are due to three factors, the relative chronicity of the affections, the localization of the lesions and the comparative ease of obtaining cultures of the specific organisms and preparing autogenous vaccines. Though most agree that autogenous vaccines should be used in order to obtain the best results, such a high authority as Gilchrist claims that the autogenous vaccines are not required, and he reports excellent results with the use of stock vaccines of the staphylococcus albus used in all cases, whether the lesion were originally caused by the staphylococcus albus or aureus. The usual method is to commence with an initial dose of from fifty to two hundred millions and to increase to from two to six hundred millions, at intervals varying from three to ten days. Many men prefer the shorter intervals, but I have myself obtained far better results with less reaction by injecting at longer intervals, not oftener than seven days apart, preferably ten. This is more in accord with Wright's theory and seems to give the best practical results.

Equal success is reported from cases of acne vulgaris. In this disagreeable and resistant disease a combined vaccine containing the staphylococcus and the *Bacillus acnes* of Gilchrist is used on the theory that the original nodule is due to the bacillus and that the pustule is a secondary infection with the staphylococcus. A good initial dose is fifty million staphylococci and five to ten million of the bacilli. The immediate results of the injection is the appearance of several new nodules and the more intense inflammation of the existing pustules, evidences of the negative phase of the immunity. This must be expected and the patient must be warned thereof beforehand. Within a few days, however, these acute symptoms subside and as a rule after from three to ten injections at ten-day intervals the disease disappears completely.

Recently several dermatologists have experimented with vaccines, especially of the staphylococcus albus in various skin diseases of unknown origin. Gilchrist is enthusiastic over their use in eczema, especially eczema seborrhœicum, in which he has produced some astonishing cures. I have myself observed some surprisingly rapid improvements in cases of eczema in patients undergoing vaccine treatment for furunculosis. Beneficial results also are reported in cases of erythema multiforme, sycosis non parasitica, dermatitis herpetiformis, acne rosacea, and pityriasis rosea.

As the diseases caused by the streptococcus are, as a rule, of a very acute rapid nature, the usefulness of the streptococcus vaccine is a matter of some doubt. Various authors have reported favorable results in cases of erysipelas, septicaemia, and scarlet fever, but these reports are not especially convincing. In using this bacterin it

must be remembered that the dose is much smaller than in the case of the other pyogenic cocci—from ten to twenty-five million.

The subject of the gonococcus comes into the domain of the internist chiefly in the treatment of arthritis, for which some authors claim many cures while others say that they have seen no benefit. In the treatment of gonorrheal vulvovaginitis in infants some very favorable results have been observed, especially at the Vanderbilt Clinic in New York. In our special division of the department of pediatrics devoted to this disease so prevalent among the poor of New York, the results of the usual methods by means of douches were disheartening in the extreme, as is shown by the fact that but sixty per cent. of cures were obtained after courses of treatment averaging ten months in duration. Vaccine treatment was then begun and the results were so good that ninety per cent. of apparent cures were obtained after treatments averaging 1.7 months, though no local treatment was employed except decent cleanliness. The dose varied from fifty to two hundred million. These results were reported some months ago by Hamilton of New York.

Among the rare diseases for which are claimed improvements and cures under autogenous vaccine treatment are actinomycosis and glanders.

Lastly I wish to mention one of the most intractable of the chronic diseases, more frequently dealt with by the dentist than the physician—pyorrhea alveolaris. Several authors have reported enthusiastically on the treatment of this disease by autogenous vaccines made from organisms isolated from the pus sockets at the roots of the teeth. The streptococcus, staphylococcus, and pneumococcus have been found and their vaccines used. In some instances when the case failed to clear up under treatment with one of these another has been obtained and used with better results. The results have been most encouraging and many cases of resistant pyorrhea have cleared up under vaccine therapy combined with proper dental treatment, after the dental treatment alone had failed utterly to give permanent results.

In this brief summary I have tried to cover the chief affections for which vaccine therapy is firmly established as of proved benefit. In the present mad rush on the part of the makers of stock vaccines to flood the markets with their products at exorbitant prices, one is in danger of being persuaded that vaccines are "cure-alls," that every disease to which mankind is heir can be cured "by a few injections of our specific and harmless vaccine." One is told that Dr. Blank has obtained marvelous results in the treatment of pneumonia; that typhoid fever can be aborted in a week; and that puerperal sepsis can be controlled with ease and dispatch. Such extravagant statements are unfortunate and harmful, not only to the individual patient, but also to the

confidence of the profession in the value of this new and useful addition to our therapeutic armamentarium.

In order to obtain the best results from vaccine therapy, the patients must be selected with care. Chronic cases or localized infections in which the body is not doing its full duty in producing natural immunity—sluggish cases—should be chosen. Cases in which a temporary increase in the severity of the disease might do permanent injury must be rigorously avoided. The etiology of the disease should be proved bacteriologically and whenever possible an autogenous vaccine should be obtained, though an initial dose of a stock vaccine may be administered if desired while awaiting the manufacture of the autogenous vaccine. The dose should be small at first and the intervals of injection should not be too short. Symptoms of constitutional reaction should be watched for diligently and in no case should an injection be given until all symptoms set up by its predecessor have subsided. The users of the vaccine should be thoroughly familiar with the principle and details of Wright's opsonic theory, should know the indications and contraindications of the various vaccines and should be conversant with the symptoms of the reaction of an overdose.

If these conditions are fulfilled, immuno-therapy will prove a boon to suffering humanity. If, on the other hand, the physician injects the vaccine carelessly on the recommendation of the paid agent of the commercial manufacturer, without first making himself thoroughly conversant with the subject, no better results can be expected than would accrue from a layman attempting to perform operations at the advice of the instrument dealer. Properly used bacterial vaccines may be expected to produce decided benefit in a limited number of cases; carelessly or unintelligently employed, they will undoubtedly do incalculable harm.

VACCINE THERAPY IN THE BRONCHOPNEUMONIA OF CHILDREN.

(Communication.)

Chicago, Ill., April 25, 1912.

To the Editor of The New York State Journal of Medicine, New York City.

SIR: I have just read with interest an article by Dr. H. A. Hoyt, of Watertown, N. Y., entitled "Broncho-pneumonia in Children," appearing on pages 186-187 of the April issue of your excellent journal.

To me this is a very important subject, and as the diagnosis of this condition is not nearly as difficult as its treatment, it seems passing strange that only nine per cent. of the paper was devoted to treatment. Further than this, the most effective treatment—the use of bacterial vaccines—was not referred to at all.

Broncho-pneumonia in children is an infectious disease, caused by certain micro-organisms, and if a suitable bacterial vaccine is secured and administered early, the results will cause more astonishment than any other therapeutic procedure which is considered *apropos* in this condition.

HENRY R. HARROWER, M.D.

Medical Society of the State of New York

ANNUAL REPORTS

1911

REPORT OF THE PRESIDENT.

To the House of Delegates:

Following the precedent established by my distinguished predecessors, and in obedience to the rules of the House of Delegates, I beg to give an account of my stewardship during the year and to make such suggestions and recommendations as have arisen from a considerable study of all phases of the field covered by our Society. I greatly appreciate the great honor which you conferred in electing me to the presidency of the Society, and in all sincerity it has been my endeavor to "make good."

REORGANIZATION OF THE SCIENTIFIC SESSIONS.

For some years a conviction had been growing upon me that while the general management of our State Society was well nigh ideal and that all of the business departments were conducted upon a high level, we had not kept pace with our scientific programs and thereby had missed unusual opportunities for our own advancement and fellowship and for making our Annual Meeting the clearing-house for all departments of medicine, surgery, humanitarian institutions and public health. On the other hand, the attendance at the Annual Meetings had gradually dwindled and there was a manifest lack of interest in our scientific sessions, so that with a membership numbering about 7,000 we only registered 412 at the Annual Meeting of 1911. I sought to find some remedy for this lack of interest in our annual conclave. My experience in other societies had proven that the attendance at the meetings had invariably depended upon the attractiveness of the program offered. It seemed, therefore, that in order to increase the interest and swell the numbers in attendance, the character, variety and scope of the annual program should be revolutionized and greatly enlarged. Immediately upon my accession to the presidency I outlined to the Council the plan of program and meeting which we are to conduct the next three days. It is a pleasure to say that the Council unanimously extended to me the full power to reorganize the Society into sections, to appoint section officers and through them, with the aid of the Committee on Scientific Work to construct the program which you have before you for the present

session. It is a further pleasure, as we near the close of the year, to state that the Council, officers and all committees have given me the most cordial and hearty support in all my efforts. The reorganization plan adopted is largely based upon that of the American Medical Association and that of a considerable number of the State societies. After mature deliberation it was decided that for the present a division of the membership into five sections would enable us to accomplish the desired results. Accordingly this was done and a reference to the annual program will show you that each section has a program numbering about as many papers as the entire annual program of 1911. It is the opinion of your President that this method of conducting the scientific session of the Society should be adopted. This opinion is warranted, first because it gives a wider scope for the presentation of papers, second, it interests all classes of practitioners of medicine and surgery, third it gives an annual opportunity for creating public sentiment in favor of proper legislation in matters pertaining to the public health, and fourth it binds together in sections men whose interests are similar. The present By-Laws, Chapter 7, Section 1 provide for a standing committee of the Society on Scientific Work and Section 2 defines its duties as follows:

"The Committee on Scientific Work shall consist of three members, including the Chairman, and shall determine the character and scope of scientific proceedings, of the Society for each session, subject to the instructions of the House of Delegates. Thirty days prior to each annual session it shall prepare and forward to the Secretary a program announcing the order in which papers, discussions and other business shall be presented."

The Chairman of this Committee is elected annually by the House of Delegates and is a member of the Council of the Society. His associates are nominated by him and approved by the Council. His term of office is one year. The Committee for the past year, consisting of Drs. Neuman, Elsner and Harris, has rendered material assistance in the preparation of the program for the present session and has heartily entered into the plans of the President and Council, but the work of securing the papers has been almost entirely done by

the section officers, and too much praise cannot be accorded them for the work they have done. To provide for a continuance of this work in the future will necessitate the adoption of some By-Law that will change the present one covering the work now performed by the Committee on Scientific Work. In the American Medical Association and in several of the State societies the sections elect their officers, and in the American Medical Association each section elects a delegate to the House of Delegates and has an executive committee of three, consisting of the chairmen of the three preceding years. The section officers are responsible for the programs of their sections and there is no Committee on Scientific Work of the Association. The programs are prepared and sent to the secretary in due season, for publication. In Pennsylvania the chairmen and secretaries of all sections provided for by action of the House of Delegates are elected by the several sections at executive meetings held immediately before the adjournment of the sections on the second day of the annual meeting and a Committee on Scientific Work is provided for, to consist of the President and Secretary of the Society, the Chairman of the Committee on Arrangements, the chairmen and secretaries of the sections and a chairman appointed annually by the President. In Ohio the State society is divided into five sections in the By-laws and the officers are elected by the sections for one year each, except that each section may elect a secretary to serve for a longer term at its discretion. The Secretary of the Society prepares and issues the program upon its receipt from the section officers. No further examples of the methods of conducting the business in other societies is necessary to show that there is considerable diversity of plans in the arrangement of these matters.

For this State it would seem desirable that the officers of the sections should in large part constitute the Committee on Scientific Work, inasmuch as they are bound to be chiefly responsible for the future programs of the Society. It would seem, however, that arrangements should be made for a chairman who might serve as a member of the Council, to be elected either by the officers of the sections themselves, the House of Delegates, or appointed by the President. To a considerable degree the President must assume considerable responsibility for the annual program and justly so. For this reason it would seem just and I recommend that the By-Laws be so changed that a Committee on Scientific Work be constituted, made up of the officers of the sections together with one person to be appointed by the President, who shall serve as Chairman of the Committee and also as a member of the council. I further recommend

that the By-Laws be so changed as to empower each section annually to elect a Chairman and Secretary and that each outgoing Chairman of a section shall serve on the Executive Committee of said section for a period of three years with the powers assigned to similar executive committees provided for by the By-Laws of the American Medical Association. To provide for all this the President recommends that a Committee be appointed to study the question and report at the Meeting of 1913. For this reason and also on account of the fact that we are passing through the formative period of the above method of conducting our annual sessions, I hereby recommend for the ensuing year that you delegate to the Council the authority to appoint the officers for the five sections now in existence or for any other sections which the Council may authorize. Such authority is granted under Article 4 of the Constitution, in the following words:

"The House of Delegates may provide for a division of the scientific work of the Society into appropriate sections, and for the organization of the District Branches; and it shall have such additional powers and duties not inconsistent with this Constitution as the By-Laws may authorize or prescribe. It may adopt rules and regulations for its own government and for the administration of the affairs of the Society, not repugnant to the Constitution and By-Laws of the Society; and it may delegate to the Council such power and authority as may be necessary to the efficient administration of the affairs of the Society, while the House of Delegates shall not be in session."

COMMITTEES.

In arranging for the present meeting it has become apparent that in order to cover the entire field of the plan and scope of the work of the Society we should increase the number of standing committees and I therefore recommend that the By-Laws be changed to authorize the Chairman of the Committee on Arrangements, who shall be selected from the city in which the annual session is held, to subdivide said Committee into

1st. Committee on Registration and Information.

2d. Committee on Hotels and Halls.

3d. Committee on Printing, Placards and Badges.

4th. Committee on Scientific and Commercial Exhibits.

each to consist of three men. I further recommend that a standing committee on entertainment to consist of five members shall be provided for, whose chairman shall reside in the city in which the Annual Meeting is to be held.

LEGISLATION.

Several matters of legislation have come before us for consideration.

PUBLIC HEALTH LAW.

A brief study of the conditions existing in many of the smaller towns of the State is sufficient to convince any observer that there is something radically wrong with the method of appointment of health officers and a lack of control of their acts. This state of affairs is reprehensible in a community like that of the Empire State. It would almost seem that our legislators are not awake to the importance of the preservation of the public health inasmuch as the appropriations for public health and sanitation are extremely meager when compared with those for various other State departments, for instance, the public health law requires the State Commissioner of Health not only to be a duly authorized physician, but he must have had ten years experience in medical practice and have shown special skill in matters pertaining to public health and sanitation. The compensation for this is placed at \$5,000 per year while the State architect receives \$7,500 a year; the Attorney to the Public Service Commission \$10,000 per year. It is also evident that the method of appointing health officers of cities of the third class, villages and townships is open to criticism inasmuch as said appointments are largely of a political nature and often without regard to the efficiency of the appointee. A glance at the program will show that several papers pertaining to this matter are to be read. I therefore recommend that either the Committee on Legislation or a special committee to be appointed by the Society, investigate these matters and recommend such legislation as may be deemed wise.

EDUCATION AND DISCIPLINE.

The President has received from the Department of Education a communication enclosing a copy of the *Journal* of a meeting of the Board of Regents of the University of the State of New York held at the Education Department in the State Normal College, Albany, December 7, 1911. On page 545 of this pamphlet it is noted that on motion of Regent Nottingham the Regents voted that the recommendations of the Commissioner of Education and the report of the Committee on Higher Education as presented by Regent Vander Veer relating to ethics and educational standards of the medical profession be referred back to the Committee on Higher Education with the suggestion that the Committee communicate at an early date with the officers of the State

Medical Society and the homeopathic, eclectic and osteopathic State societies in reference to the whole subject and report to the Regents at the next meeting.

This subject came before the Regents as the result of a communication sent to them by the Medical Society of the County of Erie, which will be found printed in full in the *New York State Journal of Medicine*, Vol. 11, No. 2, page 93. The report to the County Society of Erie was made by a committee appointed by it to investigate the division of fees, its causes and remedies, and among the recommendations in the report was "that the Secretary transmit a communication to the State Board of Regents urging the necessity of higher preliminary educational requirements and different changes in the method and scope of the examination for a license to practice in this State, and that this matter be referred to a proper standing or special committee to arouse interest, stimulate inquiry and promote necessary progressive action leading to higher medical education."

The Commissioner of Education speaks of the question of division of fees and refers also to the question of different measures of education for those who practice the healing art in different ways. This last was brought about as the result of an objection by Dr. Ralph H. Williams, an osteopath and a member of the State Board of Medical Examiners who states that in the present undeveloped situation in the schools of osteopathy it would be impossible for graduates thereof to comply with the proposed requirements of the Board of Medical Examiners. This protests leads Dr. Draper to say that "the State must eventually come to the point of exacting differing measures of education and experience from those who practice the healing art in different ways or by means of differing instrumentalities. For example, the training required of those who administer drugs is bound to be more extensive than that required of those who do not, and the training required of surgeons is bound to go further than that of those who do not resort to the use of instruments of incision. May I ask for this suggestion the most careful investigation and reflection? It is obvious that with all we do we can hardly keep abreast of the needs of the situation, and the Board may well be at all times in quest of what it may do next, and need never be afraid of decisive action which does not impinge upon sound basic principles"; and he further recommends

"That no candidate be admitted to the medical licensing examination who has not had at least one year's experience as a medical interne or resident clinical clerk in an approved hospital.

That the Board advise the practice of legislative discrimination between the requirements in the scientific training of those who only manipulate the body, those who only prescribe medicines, those who perform simple external operations, and those who perform major operations in surgery.

That wherever this program involves amendments to the medical practice act, the Legislature be requested to enact them."

The report of Dr. Vander Veer relates entirely to the question of fee-splitting and refers to the Erie County report, Academy of Medicine resolutions, etc.

To correct abuses existing within the medical profession should certainly be the duty and pleasure of all who are working for the best interests of the Society. The code of Medical Ethics of the American Medical Association under Chapter II, Article VI, Section 4, reads as follows:

SEC. 4. It is derogatory to professional character for physicians to pay or offer to pay commissions to any person whatsoever who may recommend to them patients requiring general or special treatment or surgical operations. It is equally derogatory to professional character for physicians to solicit or to receive such commissions.

A violation of the code can be punished and this section clearly defines fee splitting as unprofessional conduct. It is therefore the duty of the county societies to make diligent inquiry to see if such practices are being carried on within their counties and to promptly bring to trial any or all who may be guilty of such practices. The State Society certainly will be most willing to assist in this matter and will gladly welcome any plan of the Regents or others, which will tend to better conditions.

Regarding the suggestion of Dr. Draper on different standards for different classes of practitioners, your President believes the Society should place itself on record as opposed to the plan.

The present medical bill, public health laws, Chapter 45 of the Consolidated Laws of 1909, provides the same examination for all who desire to apply for a license to practise medicine or osteopathy in this State irrespective of the school that they graduate from except that the school should come up to the requirements provided by the Regents. The osteopaths, eclectics, homeopaths and so-called regular physicians are all placed upon the same level as far as their mental qualifications go when passing the examination. If it is desirable to increase the standard in the future it is desirable to increase it for all. Whether

it is necessary or essential that the standards be raised is a question that the society cannot well pass upon without more knowledge of the subject than it possesses.

NATIONAL DEPARTMENT OF HEALTH AND NATIONAL QUARANTINE.

For years there has been a rapidly growing sentiment in favor of a National Department or Bureau of Health. The House of Delegates of this Society at its session on January 22, 1910, endorsed the plan and passed resolutions urging upon the Congress and Senate of the United States to organize a "Bureau of Public Health" to comprise all the offices and agencies having duties in a practical way connected with the preservation of the public health. Of course the Medical Department of the Army and Navy should not be included. Two bills are now before the Senate with this end in view and the society should pass resolutions endorsing such legislation, and the members should endeavor to enlist the interest of their Senators and Congressmen in the subject.

National Quarantine control of all ports now under State control should also be strongly endorsed and the many advantages that would follow such a movement should be plainly set forth. The strong sentiment for these beneficent changes should be guided and developed, and this can only be properly done by giving the subjects and their benefits wide publicity. All are urged to carefully consider the excellent article on the subject by Leland E. Cofer printed in the March issue of the *New York State Journal of Medicine*.

CARE OF AGED AND DEPENDENT MEMBERS.

During the past year several letters have been received by the society asking if any provision had been made for the care of the aged and infirm physicians who were unable to care for themselves and whose relatives could not look after them in a proper financial manner. The New York Physicians' Mutual Aid Association has appointed a committee to formulate a plan to care for such of its members as need assistance. It would seem desirable that the Medical Society of the State of New York appoint a committee to consider this subject and to confer with the committees of other organizations that may desire to plan some form of relief for the worthy members of the profession who are in need of assistance.

WENDELL C. PHILLIPS,

President.

March 15, 1912.

REPORT OF THE SECRETARY.

To the House of Delegates:

In compliance with Section 3, Chapter VI, of the By-Laws, the Secretary submits the following report for the year ending December 31, 1911:

Membership, December 31, 1910.....	6,515	
New Members, 1911	518	
Reinstated Members, 1911	246	
	<hr/>	7,279
Deaths	121	
Resignations	68	
Expulsions	5	
	<hr/>	194
		<hr/>
		7,085
Dropped for Non-payment of Dues, December 31, 1911		343
		<hr/>
		6,742
Elected after October 1, 1911, and credited to 1912		123
		<hr/>
		6,865

The percentage of paid up to total membership on December 31st is 95 per cent. The 246 reinstated members represent 60 per cent. of the 414 dropped December 31, 1910.

The honor list of County Societies whose membership for 1911 is fully paid up is as follows:

Chemung, Columbia, Delaware, Franklin, Montgomery, Ontario, Tompkins and Washington.

The By-Laws of the County Societies provide that those who have not paid their dues and state assessments on or before December 31st are dropped automatically from membership in both County and State Society. This plan has worked admirably and the percentage of paid-up members this year is the largest since amalgamation and the delinquent list of course the smallest. Some counties provide that "No member shall be eligible for any office, or entitled to vote for any officer or delegate who has not paid his dues and assessments for the current year," and the Secretary has urged during the year that every county place a similar clause in its by-laws. He would also recommend the following addition to the constitution of the Medical Society of the State of New York—add a section 4 to Article III to read as follows:

"No member shall be eligible for any office who is in arrears for county dues or State assessment."

The Council is the Executive body of the

Society and consists of the officers and of the Chairmen of Standing Committees. It is the Finance Committee of the Society. It superintends all publications, appoints the editor of the *Journal* and performs such other duties as the House of Delegates may prescribe. All of the officers of the Society are elected annually, the eight Councilors being elected by the eight District Branches. Their duties are numerous and important and their tenure of office too short for them to become acquainted with the work. Some states elect them for five years, some for three years, but a great advance would be made in efficiency if they could be elected for two years, instead of annually as is now done. The first four branches should elect for two years after the plan went into effect and the other four for one year and thereafter all to be elected for two year terms. This would mean four new members each year and give the Council the benefit of having always four Councilors of at least one year's experience.

The Secretary suggests the following amendment to Article III of the Constitution:

Add to line five the words "except the Councilors," it will then read—"for the term of one year except the Councilors," etc.

On line nine, same paragraph, add the words "for two years." The sentence will then read—"Each Councilor shall be elected for two years by the District Branch of the District in which he resides," etc.

The following amendment to the By-Laws was presented at the last meeting and will come up for action at this session:

"Amend Chapter VIII, Section 1 of the By-Laws, taking Steuben County from Seventh District Branch and placing it in the Sixth District Branch."

Notice was also given that a motion would be made at the next meeting of the House of Delegates to change the time and place of the Annual Meeting.

The following delegates were given certificates to other Societies during the year:

Medical Society of New Jersey—William M. Leszynsky, Louis Faugeres Bishop, New York. Vermont State Medical Society—Leo H. Neuman, Albany.

Respectfully submitted,
 WISNER R. TOWNSEND,
Secretary.

December 31, 1911.

REPORT OF TREASURER.

ALEXANDER LAMBERT, *Treasurer*, In Account with THE MEDICAL SOCIETY OF THE STATE OF
NEW YORK.

DR.

CR.

CASH RECEIPTS, YEAR ENDING DECEMBER

31, 1911.	
To Balance, January 1st.....	\$10,096.73
“ Directory, 1909	\$52.50
“ “ 1910	386.50
“ “ 1911	2,189.60
“ Clerical Work	114.83
“ Interest on Deposits	400.00
“ Interest on Bonds	90.00
“ Sundry Receipts	16.97
“ Advertising	3,883.82
“ Subscriptions and Sales.....	173.62
“ Annual Dues, Arrears	24.00
“ “ “ 1909.....	30.00
“ “ “ 1910.....	744.00
“ “ “ 1911.....	19,716.00
“ “ “ 1912.....	309.00
“ Com. on Experimental Med...	11.50
“ Albany Savings Bank.....	100.00
	28,242.34
	\$38,339.07

CASH PAYMENTS, YEAR ENDING DECEMBER

31, 1911.	
By Annual Dues: Overpayments.....	\$18.00
Furniture and Fixtures.....	50.75
Traveling Expenses.....	\$211.35
Traveling Expenses, Delegates A. M. A. Meeting.....	1,003.60
	1,214.95
Accountant	200.00
Carfare	16.85
Express	25.13
Treasurer's Bond	20.00
Sundry Petty Cash Disbursements.....	132.99
Telephone	159.22
Stationery and Printing	272.30
Postage	500.90
Rent	900.00
Insurance	5.70
Committee on Legislation.....	150.00
Legal Expenses	3,613.13
1910 Directory	66.01
1911 Directory	8,441.62
JOURNAL Expense	253.01
“ Salaries	1,621.79
“ Commission	670.99
“ Publication	6,016.64
District Branches	272.12
Clerical Work	54.10
Salaries	1,843.58
Annual Meeting	509.46
Committee on Experimental Medicine....	11.50
Secretary	500.00
Lucien Howe Prize Fund.....	100.00
Interest on Bonds Deposited.....	90.00
	\$27,730.74
Balance in Guaranty Trust Co.....	10,608.33
	\$38,339.07

ANNUAL DUES, 1911.

County.	Amt. Paid.	County.	Amt. Paid.
Albany	\$486.00	Oneida	278.00
Allegany	102.00	Onondaga	465.00
Broome	186.00	Ontario	210.00
Cattaraugus	105.00	Orange	264.00
Cayuga	174.00	Orleans	81.00
Chautauqua	204.00	Oswego	162.00
Chemung	168.00	Otsego	111.00
Chenango	123.00	Rensselaer	240.00
Clinton	120.00	Richmond	141.00
Columbia	84.00	Rockland	84.00
Cortland	81.00	St. Lawrence ...	144.00
Delaware	84.00	Saratoga	138.00
Dutchess	273.00	Schenectady	273.00
Erie	1,497.00	Schoharie	33.00
Franklin	117.00	Schuyler	39.00
Fulton	90.00	Seneca	66.00
Genesee	93.00	Steuben	186.00
Greene	72.00	Suffolk	252.00
Herkimer	172.00	Sullivan	36.00
Jefferson	198.00	Tioga	69.00
Kings	2,403.00	Tompkins	132.00
Lewis	54.00	Ulster	171.00
Livingston	111.00	Warren	90.00
Madison	114.00	Washington	102.00
Monroe	669.00	Wayne	84.00
Montgomery	144.00	Westchester	597.00
Queens-Nassau ..	378.00	Wyoming	81.00
New York	7,044.00	Yates	48.00
Niagara	162.00		
	\$20,175.00		

ADVANCE DUES, 1912.

County.	Amt. Paid.	County.	Amt. Paid.
Albany	\$3.00	Oneida	3.00
Allegany	9.00	Onondaga	15.00
Broome	3.00	Orleans	15.00
Cayuga	12.00	Rensselaer	3.00
Chautauqua	6.00	St. Lawrence ...	3.00
Chenango	24.00	Schuyler	9.00
Erie	3.00	Steuben	3.00
Franklin	42.00	Suffolk	6.00
Genesee	3.00	Washington	3.00
Greene	3.00	Wayne	45.00
Herkimer	66.00	Westchester	15.00
Madison	3.00	Wyoming	6.00
Monroe	6.00		
	\$309.00		

DIRECTORY ACCOUNT, 1911.

<i>Expenditures.</i>	
Postage	\$408.78
Stationery and Printing	226.36
Delivery	855.15
County Clerk's Fees	10.75
Salaries	1,830.83
Printing and Binding Directory.....	5,106.75
	\$8,438.62
<i>Income.</i>	
Advertisements	\$1,580.00
Sales	907.60
	2,487.60
Cost of Directory	\$5,951.02

REPORT OF TREASURER.

JOURNAL ACCOUNT, YEAR ENDING DECEMBER 31, 1911.

<i>Income.</i>		<i>Expenditures.</i>	
Advertising	\$3,907.83	Publication	\$6,016.64
Subscriptions and Sales	173.62	Expense	252.71
	<u>\$4,081.45</u>	Salaries	1,621.79
Loss	4,553.29	Commission	670.99
	<u>\$8,634.74</u>	Discount	62.58
		Doubtful Debts	10.03
			<u>\$8,634.74</u>

BALANCE SHEET: DECEMBER 30, 1911.

<i>Assets.</i>		<i>Liabilities.</i>	
Cash in Bank	\$10,608.33	Annual Dues, 1912	\$309.00
Accounts Receivable	367.17	Accounts Payable	91.75
Furniture and Fixtures	\$100.00	Lucien Howe Prize Fund..	\$1,745.65
Directory Catalogue	250.00	Merritt H. Cash " ..	923.48
	<u>350.00</u>		2,669.13
Directory, 1911	300.00	Surplus, Jan. 1, 1911.....	\$10,574.65
Union Dime Savings Institution....	\$446.70	Gain, 1912	850.85
Albany Savings Bank.....	222.43		<u>\$11,425.50</u>
Title G. & T. Co. Mtg. Cfs.....	2,000.00	Furniture Depreciation.....	200.75
	<u>2,669.13</u>		
		Surplus Dec. 30, 1911.....	11,224.75
			<u>\$14,294.63</u>

I hereby certify that the above Balance Sheet is correct as shown by the books.

A. H. WICKS,
Certified Public Accountant,
302 Broadway, New York.

INCOME AND EXPENDITURES, YEAR ENDING DECEMBER 31, 1911.

<i>Income.</i>		<i>Expenditures.</i>	
Arrears of Dues	\$792.00	Expense	\$1,618.82
Dues, 1911	20,163.00	Telephone	152.22
Interests on Deposits	400.00	Stationery and Printing	267.63
Clerical Work	60.73	Postage	500.90
Directory, 1909	52.50	Rent	900.00
Directory, 1910	220.49	Insurance	5.70
		Salaries	1,843.58
		Committee on Legislation	150.00
		Legal Expense	3,613.13
		Annual Meeting	509.46
		District Branches	272.12
		1911 Directory	5,951.02
		Secretary	500.00
		JOURNAL LOSS	4,553.29
			<u>\$20,837.87</u>
		Excess of Income	850.85
	<u>\$21,688.72</u>		<u>\$21,688.72</u>

INCOME AND EXPENDITURES, YEAR ENDING DECEMBER 31, 1910.

<i>Income.</i>		<i>Expenditures.</i>	
Arrears of Dues	\$774.00	Expense	\$834.48
Dues, 1910	19,677.00	Telephone	139.10
Interest on Deposits	358.41	Stationery and Printing	223.36
Clerical Work	84.53	Postage	431.52
Directory, 1908	2.00	Rent	900.00
Excess of Expenditures	479.22	Insurance	5.70
		Salaries	1,890.42
		Committee on Legislation	155.75
		Legal Expense	4,590.79
		Annual Meeting	595.97
		District Branches	407.51
		1909 Directory	320.56
		1910 Directory	6,865.78
		Secretary	499.99
		JOURNAL LOSS	3,514.23
	<u>\$21,375.16</u>		<u>\$21,375.16</u>

REPORT OF THE COUNCIL.

To the House of Delegates:

The Council of the Medical Society of the State of New York begs leave to present the following report:

During the past year meetings have been held on the following dates:

April 19th, in Albany. Minutes will be found in the *New York State Journal of Medicine*, volume 11, No. 5, page 248.

May 19th, in New York. Minutes will be found in volume 11, No. 8, page 393.

A full report of the Committee on Publication is herewith appended, and for the expenses of the Society, the House of Delegates is referred to the Annual Report of the Treasurer. All bills have been properly audited and the accounts examined and certified to by A. H. Wicks, a Certified Public Accountant of the State of New York.

Respectfully submitted,

WISNER R. TOWNSEND,
Secretary.

December 31, 1911.

REPORT OF THE COMMITTEE ON
PUBLICATION APPOINTED BY
THE COUNCIL.

The committee appointed by the Council at the meeting in New York City on May 19, 1911, consisting of Drs. S. E. Getty, Yonkers; H. A. Fairbairn, Brooklyn; S. W. S. Toms, Nyack; Alexander Lambert, and Wisner R. Townsend, New York City.

At the first meeting on May 31, 1911, S. W. S. Toms was appointed Chairman for the ensuing year.

Dr. Algernon T. Bristow, of Brooklyn, was appointed Editor by the Committee.

The business devolving upon the Committee on Publication consists in the editing and management of the *State Journal of Medicine* every month and in the issuing of the Medical Directory in October of each year.

JOURNAL.

The *Journal* has been issued monthly on the fifteenth and the committee takes pleasure in expressing the appreciation of the good work done by the Editor in the selection and arrangement of the papers and in the editorials.

The income from the *Journal* advertisements amounted to \$3,907.83 and from subscriptions and sales \$173.62. The cost was \$8,634.74, leaving a net cost of \$4,553.29. 8,000 copies are issued monthly.

All advertisements of medical preparations that do not conform with the rules of the

American Medical Association as adopted by the Council on Pharmacy and Chemistry are rejected, which accounts for the small amount of advertising.

DIRECTORY.

The committee has given careful consideration to the needs of the profession in the classified information contained in the Directory and by selecting new styles of type and rearrangement of the printed matter, it has been able to curtail in some measure the cost over previous issues and the committee has further saved \$250 by using all white instead of colored paper to designate the various sections for reference purposes. The last issue was 7,500 copies and will be exhausted before the 1912 issue appears. The income from advertisements was \$1,580. The sales have amounted to \$907.60. The net cost of the publication amounts to \$5,951.02, which includes delivery charges, etc.

The committee would welcome suggestions from members of the State Society at any time that would add to the worth of the *Journal* or Directory in making them more useful or increasing their value and completeness.

Respectfully submitted,

S. W. S. TOMS, *Chairman*,
H. A. FAIRBAIRN,
S. E. GETTY,
ALEXANDER LAMBERT,
W. R. TOWNSEND.

December 31, 1911.

REPORT OF THE COMMITTEE ON
PUBLIC HEALTH.

To the House of Delegates:

Your Committee on Public Health would respectfully submit the following report of progress:

On November 23d the following letter was addressed to the Presidents of the County Societies of the Medical Society of the State of New York, together with the four questions appended.

DEAR DOCTOR: On behalf of the Committee on Public Health of the Medical Society of the State of New York I am writing to ask you the following questions regarding laboratory facilities in the County of _____ and their availability for the medical men at large in the county.

Your prompt response to this letter of inquiry will greatly facilitate the work of and be appreciated by the committee, which must render its report to the Council of the Society at its stated meeting on the 15th of December next.

Sincerely yours,

(Signed) JOSHUA M. VAN COTT,
Chairman Committee on Public Health.

1. Have you the facilities in your county for the proper examination of sputum, urine, feces, gastric contents, blood for malaria, cultures for diphtheria, Widal and Wassermann reactions and tumors?
2. Have you a county hospital, or if not, a private institution where a county laboratory of the type required for such diagnostic work as Question 1 calls for could be maintained?
3. Where, in your opinion, should a laboratory for clinical diagnosis be stationed in your county in order to be of the greatest service to the physicians in the county?
4. Does your county already possess a diagnostic laboratory, maintained by it or a municipality?

The response to these questions are as follows:

	1	2	3	4
Albany	Yes	Yes	No	Bender Hygienic Lab.
Allegany	No	No	No	Wellsville
Boome	No	Yes	No	Binghamton
Cattaraugus	Yes	Yes	Yes	
Cayuga	No	Yes	No	Auburn
Chautauqua	No response			
Chemung	Yes	No	No	
Chenango	No	No	No	Norwich
Clinton	No	Yes	No	Plattsburg
Columbia	No	Yes	No	Hudson
Cortland	No	Yes	No	Cortland
Delaware	No	No	No	Delhi
Dutchess	Yes	Yes, T. B.	Yes	Poughkeepsie
Erie	Yes	Yes	Yes	Buffalo
Franklin	No response			
Fulton	Yes	Yes, Pr.	No	Gloversville
Genesee	Yes	Yes, Pr.	No	Woman's Hosp., Batavia
Greene	No	No	No	Catskill
Herkimer	No	Yes	No	Ilion
Jefferson	Yes, Pr.	Yes	No	Watertown
Kings	Yes	Yes	Yes	Brooklyn
Lewis	No	Yes	No	Lowville
Livingston	Yes	Yes, Pr	Yes	Genesee
Madison	Yes	Yes	Yes	
Monroe	Yes	Yes	Yes	
Montgomery	Yes	No	Yes	Amsterdam
Nassau-Queens	Yes	Yes	Yes	Mineola
New York	Yes	No	Yes	Board of Health
Niagara	No, Pr.	No	Yes	Niagara Falls
Oneida	Yes, Pr.	Yes	No	Utica
Onondaga	Yes	Yes	Yes	Syracuse
Ontario	Yes, Pr.	Yes	Yes	Canandaigua
Orange	Yes, Pr.	Yes	No	Newburgh
Orleans	No response			
Oswego	No response			
Otsego	No	Yes	No	Cooperstown
Rensselaer				
Richmond	Yes, Pr.	Yes	Yes	St. George
Rockland	No	Yes, Pr.	No	Nyack
St. Lawrence	No	No	No	Canton
Saratoga	No	Yes, Pr.	No	New Saratoga Spgs. Hosp.
Schenectady	Yes, Pr.	Yes, T. B.	No	Schenectady
Schoharie	No	No	No	Schoharie
Schuyler	No	Yes, Pr.	No	Watkins
Seneca	No	No	No	Seneca Falls
Steuben	Yes	No	Yes	Corning
Suffolk	No	No	No	Central Islip State Hosp.
Sullivan	No			
Tioga	No	No	No	Owego
Tompkins	No	No	No	Ithaca
Ulster	No	Yes	No	Kingston
Warren	Yes	Yes	Yes	Glens Falls
Washington	No	No		Not wanted
Wayne	No	No	No	Palmyra
Westchester	No	No	No	White Plains
Wyoming	No	Yes, Pr.	No	Warsaw
Yates	Yes	No	No	Penn Yan

After due deliberation the conclusion was arrived at that, in view of the unsettled state of the legislature, it would be unwise at present to take any step towards securing appropriation of money by the State for laboratory purposes.

Respectfully submitted,
 JOSHUA M. VAN COTT, *Chairman.*
 EGBERT LE FEVRE.
 CHARLES STOVER.

December 31, 1911.

REPORT OF THE COMMITTEE ON LEGISLATION.

To the House of Delegates:

The Committee on Legislation have the honor to report: The work of this committee, in the absence of any specific instructions from the Society, has been to promote the enactment by the Legislature of such bills as seemed to us to promise benefit to the people of the State and to the medical profession and to oppose the passage of those that would, if enacted into laws, tend to interfere with scientific investigation, sanitation and prophylaxis.

The bills which became laws, in which our Society is most interested, are:

Chapter 128. Establishes a State institute for the study of malignant and allied diseases at Buffalo; it may receive in its hospital and treat without pay, cases of these diseases. Appropriation, \$65,000.

Chapter 278. Makes a change in the physician's legal duties in making reports of death. He reports the cause of death, delivers the certificate to the undertaker, who is responsible for the filling out and filing.

Chapter 335. Puts the supervision of cold storage establishments under the Department of Health. Prohibits too long retention of food and provides that when sold it must be properly represented.

Chapter 553. Amends the public health law. Forbids the pollution of the waters of the State and provides penalties and a method of enforcing them.

Chapter 278. Forbids the sale or gift of hypodermic syringes or needles with the order of a duly licensed physician or veterinarian, the name of the purchaser, date of sale and description to be recorded and preserved.

The following bills were passed by the Legislature and vetoed by the Governor:

A. 290, by Mr. Turley. Providing that physicians' prescriptions must state whether patient is an adult or child, and if child the age. Committee opposed.

A. 696, by Mr. Carew. Forbidding the use of public drinking cups. Committee favored.

A. 1906, by Mr. McKeon. Amending the public health law providing for less space in dormitories of institutions for the care of orphan, vagrant and destitute children and juvenile delinquents.

A. 577, by Mr. Bush. Providing for the establishment of a school of sanitary science and public health at Cornell University. Appropriation, \$10,000.

The following were some of the bills introduced but did not pass the Legislature:

A. 270, by Mr. Baumes. Repealing Sections 310-311 of the public health law requiring vaccination of school children.

A. 286, by Mr. Hoey. Establishing a commis-

sion of seven members to inquire into the practice of vivisection.

A. 245, by Mr. Parker. Amending public health law so that physicians must report cases of venereal diseases.

S. 397, Mr. Pollock; A. 582, Mr. Parker. Providing that the Regents shall control vivisection.

S. 413, Mr. McMannus; A. 583, Mr. Boylan. Providing that unvaccinated children may attend school on certificate of physician or if the parents or guardian have conscientious opposition to vaccination.

S. 310, Mr. Bayne; A. 713, Mr. Hoey. Establishing a commission without pay to inquire into the practice of vivisection.

A. 849, Mr. Fry. Forbidding the use of drinking cups in schools.

S. 817, Mr. Travis; A. 1210, Mr. Ahearn. Requiring physicians to report on death if within six months injections of serum or antitoxin had been made or vaccination has been made.

A. 1219, Mr. Schlivek. Forbidding use of public towels in lavatories of hotels or other public places.

A. 1361, Mr. Schifferdecker; S. 981, Mr. Sanner. Providing that bottles containing poison be of a peculiar shape or that the corks in the bottles be of peculiar shape.

S. 1298, Mr. Bayne. Appropriating \$10,000 and creating a commission to inquire into the practice of vivisection.

The thanks of the committee are due to the officers of the State Department of Health, Dr. Simon Flexner, Dr. W. B. Cannon, Dr. W. H. Park, Dr. James Ewing, Prof. F. S. Lee and Mr. Jerome Green for their efforts before the committees on public health and the Senate Judiciary Committee in opposition to the anti-vivisection and anti-vaccination bills.

R. P. BUSH, *Chairman.*

LEWIS K. NEFF.

CHARLES R. BARBER.

December 31, 1911.

REPORT OF THE COMMITTEE ON EXPERIMENTAL MEDICINE.

To the House of Delegates:

GENTLEMEN—The Committee on Experimental Medicine begs leave to submit to your attention and consideration the following:

Your notice is respectfully called to the activities of those who are engaged in opposing vivisection as at present practiced for the purposes of advancing scientific medicine. During the legislative sessions of 1910 and 1911 six bills directed to the foregoing aim were introduced. Believing that it may be interesting and instructive to you to know something of the tenor of each of the bills, the texts of each in this respect will be mentioned

as briefly as practicable and in the order of presentation, as reported to your chairman.

1. The "Hoey Bill," introduced February 1, 1911, provided for the appointment by the Governor, of a commission of seven, consisting of two physicians or scientific men, two members of a society for the restriction of vivisection, two lawyers, and a member at large for the object of investigating animal experimentation and existing legislation bearing on the subject. It appears that no provisions were made for the expenses of the committee.

2. The "Bayne Bill," introduced February 8, 1911, was practically identical with the preceding except that provisions were made that expenses of the committee be borne by contributions of "interested parties."

3. The "Pollock Bill," introduced February 16, 1911. This bill amended the education law by the addition of an article directed to vivisection, restricting the practice to registered places and to regular physicians licensed by the Board of Regents for the practice of vivisection; and providing for this inspection by officers appointed by the Board of Regents, from lists certified by any New York corporation, one of whose objects was to prevent cruelty in animal experimentation. The use of urari or curare was forbidden. It also prescribed quite definite reports once in six months, to the Commissioner of Education, and fixed a penalty of fine or imprisonment, or both for violation of the act, including the refusal to admit authorized inspectors to experimental laboratories.

4. The "Hoey Bill" (No. 2), introduced February 24, 1911. Similar to the preceding Hoey Bill (No. 1) except for the addition of an appropriation of \$4,000 thus providing for the expenses of investigation.

5. The "Griffin Bill," introduced May 1, 1911. A bill amending the penal code relating to cruelty to animals by prescribing the use of anæsthesia under stated conditions.

6. The "Bayne Bill" (No. 2). This bill was similar to Bayne Bill (No. 1), but provided for an investigating committee of seven appointed by the Governor, "one each from the Senate and Assembly," the remaining five at large, with an appropriation of \$10,000 for the purposes of clerical and other expenses.

Each of the foregoing bills was opposed by your committee, both by a campaign of education and by arguments before legislative committees.

The presentation to the public of the truth regarding medical research has been maintained by your committee at the expense of much time and money, supported by generous friends of science and humanity.

The chief arguments relating thereto, before the legislative committees were made by Prof.

James Ewing, of Cornell University, Prof. Wm. H. Park, of the New York University, and Dr. Simon Flexner, of the Rockefeller Institute. It is to these gentlemen mainly, through whose energy, loyalty and skill, we are profoundly indebted because of the outcome of the hearings before the respective committees. In one instance Prof. W. B. Cannon, of Harvard University, attended and added the force of his personality and knowledge to the importance of the occasion. It is respectfully recommended that a vote of thanks be extended to each of these gentlemen for their efficient services and that a communication relating thereto be addressed to each of them by the President of the State Society. Also, Mr. Jerome D. Greene, of the Rockefeller Institute, rendered signal services in these instances. Letters of protest against interference with animal experimentation relating to medical advance, from the President of the New York Academy of Medicine and deans of the medical faculties of Columbia, Cornell and University and Bellevue Medical Colleges, were presented. Our thanks are also due to the Committee on Legislation for their efficient co-operation.

Only two of the foregoing bills were reported from the committee both of which were signally defeated. The remaining four expired in committee.

Nowhere does any evidence appear that the profession at large in the State are appreciably interested in the defense which must be continuously maintained against those who would destroy or limit the capacity of all physicians to relieve human suffering and prevent the spread of disease. It is a sad commentary, indeed, that out of a membership of more than 7,000 in the State, apparently less than 1 per cent. of this number evince an appreciable interest in the outcome which should concern each and every member of the society in the profoundest degree, to say nothing of the profession in the country at large. It is hoped that in the future a more encouraging response from members than this may be reported.

The attention of the House of Delegates is respectfully called to the need of reorganizing the Committee on Experimental Medicine, thus fitting it for more active and earnest services in the future. Possibly some of its members are no longer living, and surely some seem practically moribund so far as the Committee's labors are concerned. Of course, it is not feasible for those who reside at great distances in the State to be present at the meetings, but surely each of these can, in his own way, by consultation with his fellows, and his representative at Albany, render most efficient service in support of the cause of medical science and education. Some members, how-

ever, who are near to hand should respond to the call of this duty better than heretofore or should give way to those who may regard the opportunity for such service as of greater significance than now appears to some delinquent members who are located not far away. There seems to be no doubt of the fact that the contention which has been so long maintained in opposition to animal experimentation will be more or less active for some time to come. It is, therefore, very essential that the committee responsible for the proper conduct of opposition to these attacks be reliably constituted in all respects and also receive an increasing and substantial support from each and every member of the organization. And in this connection, so that the contributive and combative spirits of the comparatively few who thus far have borne the burden of the contest, may not become unduly wearied or burdened in providing means in which all should share, it is respectfully recommended that a co-operative appropriation not to exceed at this time \$150 be made from the funds of the society, the same to be employed through and with the approval of the Finance Committee of the Council of this organization.

Respectfully submitted,

JOSEPH D. BRYANT, *Chairman*,
JOHN S. THACHER, *Secretary*.

December 31, 1911.

**REPORT OF THE COMMITTEE ON
SCIENTIFIC WORK.**

To the House of Delegates:

The Committee on Scientific Work begs to submit the following report for the year ending December 31, 1911:

The Annual Meeting of 1911 was held in Albany, April 18th and 19th, and a full and complete scientific program, which was well discussed, was presented to the members. Reports of the discussion and the papers have been printed in full during the past year in the *New York State Journal of Medicine*. Preparations are well under way for the meeting of 1912, to be held on Tuesday, April 16th, Wednesday, April 17th, and Thursday, April 18th.

Respectfully submitted,

L. H. NEUMAN, *Chairman*.

December 31, 1911.

**REPORT OF THE COMMITTEE ON
ARRANGEMENTS.**

To the House of Delegates:

The Committee on Arrangements has the honor to submit the following report of the expenses of the Committee which have been paid by the Medical Society of the State of New York for the year 1911:

THE MEDICAL SOCIETY OF THE STATE OF
NEW YORK IN ACCOUNT WITH THE
COMMITTEE OF ARRANGEMENTS.

Printer	\$5.50
Pay for pages	36.00
Stenographer, postage, stationery, etc.	8.10
Music and musicians' dinner.....	46.00
Calcium Light Company.....	12.00
Complimentary dinner tickets for guests	29.75

\$137.35

Expenses of the dinner paid by the Society from sale of dinner tickets, \$267.00.

The Committee also begs to report that the City Hall at Albany has been secured for the Annual Meeting of 1912.

Respectfully submitted,

W. J. NELLIS,
Chairman.

December 31, 1911.

**REPORT OF THE COMMITTEE ON THE
REGULATION OF THE INTRODU-
TION OF MEDICAL EXPERT
TESTIMONY.**

To the House of Delegates:

Your special committee on Expert Testimony begs leave to make the following report for the year 1911.

The Hon. A. T. Clearwater, Chairman of the Bar Association Committee seemed to think that it was not advisable to introduce any bill during the present year, owing to the fact that the Legislature did not seem to be in a disposition to do anything with constructive legislation.

If the Legislature during the year 1912 appears to be one that we will get some action from, our bill will be introduced and we shall endeavor to push it to passage.

Your committee, therefore, begs leave to report that the matter has remained in *statu quo* during the year 1911, and hopes to be able to report progress for the year 1912.

Respectfully submitted,

DWIGHT H. MURRAY, *Chairman*,
A. WALTER SUITER,
JOHN A. WYETH,
A. T. BRISTOW,
EDWARD D. FISHER,

December 31, 1911.

REPORT OF COMMITTEE ON UNIFORM MEMBERSHIP.

To the House of Delegates:

The Committee consisting of Drs. E. Le Fevre, New York; S. B. Ward, Albany; W. W. Skinner, Geneva; J. C. MacEvitt, Brooklyn, and Wisner R. Townsend, New York, appointed at the last meeting of the House of Delegates of the Medical Society of the State of New York, to consider the legality, expediency and advisability of making every member of a county and state society *ipso facto* a member of the American Medical Association, begs to report that it has held no meeting, because the American Medical Association up to the present time has failed to present any definite plan for consideration.

Respectfully submitted,

EGBERT LE FEVRE, *Chairman.*

WISNER R. TOWNSEND, *Secretary.*

December 31, 1911.

REPORT OF THE COUNSEL.

To the Officers, Council and Members of the House of Delegates of the Medical Society of the State of New York:

GENTLEMEN—I have the honor to transmit herewith my report of malpractice defense for the year 1911, with some observations upon other legal phases of work presented during the past year.

The year 1911 has in some respects been a most extraordinary one. More suits have been instituted during this year than during any year since 1906, and more cases have been actually disposed of in Court than in any year since organized malpractice defense was established. This year has seen the final defeat of every action brought against a member of the State Society and defended by me, and there are no appeals from any verdict pending, all having been set aside.

September of last year terminated eleven years of organized malpractice defense in this State, during which time upwards of three hundred suits have been brought to me for defense, and something over one hundred and ninety actually defended by me in court. Verdicts have been rendered in four cases against the medical defendants, all of which verdicts have been set aside. Five cases have been tried twice, and one case three times. One reason why a larger number of cases than ever before have been *tried* during this year, is that there has been quite an accumulation of cases covering a period of two years. The reason why a larger number of cases have been brought this year than for many years past, I cannot satisfactorily explain, except in one instance, where it appears that verdicts were secured against a dentist and a physician who

was not a member of the State Medical Society, when soon thereafter there appeared in that particular locality five malpractice cases against members of the State Society; the increase in membership of the State Society, does not in itself afford a sufficient number to account for this increase in suits brought.

The willingness of members of the State Society and others, to make use of what is known as indemnity insurance, is a potent factor in breeding malpractice cases. I believe members of the profession should abandon this practice of taking out insurance; it might be thought to show moral weakness on the part of members of the profession, and is harmful not only to the man who is the holder of this policy, but to the profession as well.

In the disposition of twenty-three cases during the past year, quite an extraordinary event transpired, in that your counsel was required to defend two doctors in the same county, at the same Term of Court, and during the same week, in fact, six of the jurors in the first case appeared as jurors in the second one, and in both cases the same disease was present—arthritis.

The public has been further informed during the last year of this organized malpractice defense on behalf of the physicians by the representative medical organization of the State, which knowledge is bound to be of benefit as will be demonstrated by the record of new cases for the coming years. I have been opposed to publicity of this defense until now. I believe it should be given more publicity, principally for its moral effect on the public.

The verdict of \$500 referred to in my report for the year 1910, which was then on appeal, was decided by the Appellate Division of the Third Department in favor of the physician, and has since been retried and won by the defendant.

The legal work of your counsel in behalf of the State Society, outside of malpractice defense, has been necessarily widely extended. There has been a continual increase in correspondence and inquiry in the nature of consultation with your counsel by members of the profession, on various legal questions, which shows the broadening interest of members in the State Society itself, and also its legal department, and demonstrates the desire on the part of the State Society membership to familiarize itself with legal questions and principles involved in the practice of their profession, all of which is most gratifying. State Societies of other states are continually inquiring through their officers as to the advantages of organized malpractice defense, and new efforts in various states are being formulated in this direction.

I desire to thank publicly the following physicians and surgeons who have graciously and

gratuitously, through self-sacrifice and earnest effort, materially aided your counsel in the defense of malpractice actions: Doctors Wendell C. Phillips, James F. McKernon, John B. Rae, Wisner R. Townsend, Elmer E. Larkin, William Francis Campbell, Grover W. Wende, Irving S. Haynes, William S. Bainbridge, Charles E. Townsend, Charles N. Skinner, William L. Cuddeback, Emerson B. Lambert, Cassius D. Silver, William Ward Plummer, Charles A. Van der Beek, Charles R. Phillips, Harvey P. Jack, Arthur L. Bugbee, George E. Jessup, Egbert Le Fevre and George Knight.

The following is a list of cases begun during the year 1911:

1. This action was one brought for \$25,000 for alleged malpractice and negligence on the part of the attending surgeon, in that a urethroscope was carelessly and heedlessly used, and that a mistake was made in diagnosis in that the patient's condition was diagnosed as an enlarged prostate, when, as a matter of fact, he had stones in the bladder.

2. This action was brought in a municipal court, and it was claimed therein that a mistake was made in diagnosing a fracture of the shaft of the femur, and that by reason of the failure of diagnosis and the resulting improper treatment, the patient's leg had to be opened and the bone rebroken and wired, causing the parent unnecessary expense and the child a great deal of unnecessary pain.

3. This was an action brought against two physicians, wherein it was claimed that they, together with a bishop, had conspired together to incarcerate the patient in an insane asylum. The patient in this case was actually placed in an insane asylum and remained there for some time, but was subsequently discharged. This case did not come within the malpractice defense, but your counsel felt that the physicians should be cared for, and that the questions involved were so closely linked with malpractice defense that the State Society should undertake their defense.

4. This was an action wherein the patient claimed that the doctor had carelessly operated on a felon on the patient's finger, and that as a result of this carelessness patient had been damaged in the sum of \$5,000.

5. This action and the one preceding were brought by a patient against the physician, who is also the defendant in the preceding case. The question involved in this case was a fracture of the right femur. The plaintiff set forth in the alleged cause of action that the doctor carelessly and negligently set the fracture, and the patient was caused unnecessary pain and deformity.

6. In this particular case the doctor has local attorney, and your counsel was asked to come into the case as counsel only. The negligence consisted of the improper treatment of the patient's eye and nose.

7. This action was brought against a doctor upon the ground that he had been careless and negligent in the treatment of the wife of the plaintiff in confinement, and that he had negligently allowed her to become infected at the time of the birth of the child, and that the child itself had unnecessarily been destroyed in delivery.

8. This action was begun by the father of the patient for \$50,000 wherein the father claimed that the attending doctor had carelessly and negligently, at the birth of the infant patient, injected into the eye of the patient a 100 per cent. solution of nitrate of silver, and that, by reason of this carelessness, the sight of the child's eye was destroyed. No action has yet been begun by the child in its own behalf, but as infancy bars the run

of the Statute of Limitations, an action by the child may ensue if this action on the part of the plaintiff's father succeeds. His action is for loss of services and for unnecessary expense in having the child treated.

9. The foundation for this action is an operation by a surgeon upon the wrist of the patient. It was claimed by the patient that at the time of operation upon the wrist, the wrist bone became infected through the carelessness of the surgeon, and that it became necessary subsequently to have several bones of the hand and the top of each of the long bones in the arm removed, and that the patient now has an absolutely useless wrist, arm and joint.

10. This action represents another of the defendants in one of the foregoing cases referred to above, wherein conspiracy is charged to place patient in an insane asylum.

11. The plaintiff in this action alleged carelessness on the part of the attending physician who undertook to reduce a fracture of both bones of the plaintiff's leg, and it is claimed that the physician used improper splintage, and that by reason of the carelessness of the doctor, the patient's leg was unnecessarily shortened and deformed. The doctor began an action for his bill at the same time, and both cases were tried as one. The doctor recovered his bill.

12. The basis of this action was failure to discover and properly adjust, splint and treat a fracture and dislocation of the patient's right arm. It was contended that the usual examination was made by the physician, but the patient claimed that the physician did not discover or properly treat the condition present.

13. This action was brought against two physicians for failure to properly care for, reduce and splint the fracture of a boy's leg. The attending physician is sued as such, and he brought in a consultant, who is also sued. The child was treated in a hospital for some weeks, and was finally removed from the hospital without the consent of either of the physicians, the parents taking the responsibility.

14. This action represents the second defendant in the case next preceding, wherein it is alleged that there was improper treatment of the fracture of the child's leg.

15. The basis of this action was a claim on the part of a woman patient, that the doctor had failed to properly diagnose, reduce and treat a fracture of the femur. The physician in this case had two actions brought against him, one by the woman patient for \$10,000.

16. This involved the same question as the preceding case, the action being brought by the husband for loss of services and expenditures incident to the treatment of the broken femur, which by reason of the defendant's negligence, was wrongly cared for. This action is for \$5,000.

17. The foundation for this action is that the physician improperly and carelessly omitted to take care of a child, who fell and severely lacerated his hand on glass, and came to the physician suffering from severe hemorrhage. It is alleged also in this case that the child developed evidence of tetanus, but did not die. The child's action is for \$10,000, and the parents' action, brought at the same time, is for \$2,000 for loss of services.

18. The patient alleges in this case that the attending physician was called to set a bone and "heal an injury to plaintiff's left thumb," and that his negligence consisted in improperly draining the wound, and that blood poisoning followed. The patient claimed that he *may lose the use of his thumb and right arm and hand, and that he has spent large sums of money in trying to be cured.*

19. The foundation of this action is a claim that the doctor improperly treated the ingrowing toenail of the patient; she sues for \$25,000. In this case your coun-

sel set up the Statute of Limitations on the ground that malpractice cases must be brought within two years. The plaintiff's attorney demurred to this defense, but the demurrer was overruled and the defense sustained. Thereupon the plaintiff's counsel appealed to the Appellate Division from that decision but was defeated, and the defense stands as a complete bar to the action.

20. This action was brought against a surgeon for failing to diagnose a fracture of the surgical neck of the femur. It appears that the patient fell on a sidewalk and was carried into the house, and the surgeon called in the evening. He carefully examined the patient's condition and stated that he was unable to determine whether or not a fracture of the neck of the femur was present. He called the next morning and made a further examination, and finally stated that the neck of the femur was not fractured, that there was a severe bruise and contusion, and in a few weeks directed the patient to get up and use her leg. It was stated that subsequently there appeared a shortening of this leg. The patient sued, claiming that there was a fracture originally and that the doctor had failed to diagnose it and had not given her proper treatment.

21. This action was begun by the service of a summons only. Another attorney appeared, but your counsel was substituted and served the order of substitution. It is claimed that the woman patient was suffering from some female weakness.

22. This action was brought by an infant plaintiff against two physicians, one of whom is a member of the State Society and the other is not. It is claimed that the doctor attending the child at birth requested another physician in attendance to go to his case and get a bottle containing argyrol to put into the child's eye, and it was contended that this physician brought iodine instead, with disastrous results.

23. This action was begun by the service of a summons only, against two doctors, although the summons was only served upon one defendant. The basis of this action was, although no complaint was ever served, that through the negligence of the defendants an infant child died of chloroform poisoning incident to a surgical operation. It appears that the child had been given an anæsthetic on one other occasion and showed no bad results, and while the examination on this occasion was made carefully by the attending doctors, and no reason appearing which would contra-indicate the use of the chloroform, the child died.

24. This action was begun by the service of a summons only. A notice of appearance by your counsel was served, and the time to serve a complaint in the action was extended, but complaint was never served. The basis of the claim was that an injury had been received by the plaintiff by having torn off the end of his thumb. The treatment in this particular case was continued for some days, and finally an operation on the stump of the thumb was completed and a good result secured. Your counsel permitted the patient to discontinue the action, after having required him to give a general release and forever terminate the controversy.

During the past year twenty-three cases have been finally disposed of, which include two cases on appeal, wherein your counsel has been called upon to reduce all of the testimony to narrative form, have the same typewritten, attend to its printing, write briefs, and appear in the Appellate Court. During the past year also, for the first time, the Board of Censors of the State Society has had before it an appeal from an expulsion on the part of members of one of the county societies of the State, and your counsel has been necessarily called upon to advise in this respect with the officers and

censors, and especially so from the fact that this particular appeal was a precedent and great care was required. Consultations with your counsel in sixty-one different matters have been had during the past year, and many opinions have been asked and furnished pertaining to the relation of the members to the medical profession. Reference is made to these matters simply for the purpose of directing your attention to the ever broadening legal endeavors of your counsel, much of it outside the scope of his employment.

The work of the State Society through its legal department can and should be still further broadened, and while your counsel's contract with the State Society is within the narrow limits of malpractice defense, yet he has felt that he should at all times be in readiness to afford legal assistance, in any direction, to those requesting it.

All of which is respectfully submitted.

JAMES TAYLOR LEWIS,
Counsel.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE FIRST DISTRICT BRANCH.

To the House of Delegates:

I have the honor to report the work of the First District Branch for the past year.

The Executive Committee was called together early in June at the Palatine Hotel, Newburgh, and a good representation was present. The spirit of the committee was one of enthusiasm and plans were outlined to make the year a successful one. The energy displayed at the June gathering was not fitful, for it broadened out in faithful work in developing a special interest in active preparation for the October Meeting. The annual meeting was held at Yonkers, October 12th, with an attendance of over one hundred and fifty. A letter from Dr. Jacobi was read regretting his inability to be present and extending his best wishes to the Branch. Dr. Wendell C. Phillips, President of the State Society made a forceful address. The program consisted of eleven numbers and the papers and discussions were of a high order of excellence. Dr. Simon Flexner's address on "Present Status of Our Knowledge of Poliomyelitis" was the feature of the meeting and he was accorded a vote of thanks.

The local reception committee headed by Dr. Samuel E. Getty made the detail of arrangement most satisfactory. A bountiful luncheon was served at the City Club.

In reviewing the work of the year which practically ended at the Yonkers meeting, this important point was distinctly brought out.

The success of the District Branch does not rest so much upon adding new names to the County Society membership, as it does in bringing into activity the members who rarely appear at society gatherings. This I believe can be overcome to a degree by aggressive work by the County Presidents, by planning in advance attractive programs for each and every meeting, and by a personal canvass which shows the latent member the personal advantages of society attendance. Active county meetings mean enthusiastic District gatherings and will certainly insure a larger attendance upon the meetings of the State Society.

The officers chosen for the ensuing year were as follows: President, Daniel B. Hardenberg, Middletown; Vice-President, John C. Otis, Poughkeepsie; Secretary, Charles E. Denison, New York; Treasurer, George S. Mooney, Yonkers.

Respectfully submitted,

W. STANTON GLEASON,
President First District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE SECOND DISTRICT BRANCH.

To the House of Delegates:

The Councilor of the Second District Branch has attended meetings of the Suffolk County Medical Society and of the Queens-Nassau Medical Society. The attendance in each was over one-third of the total membership and the membership comprises between eighty and ninety per cent. of all physicians in active practice in the three counties. No visit was made to the Richmond County Medical Society, for it was understood that steps had been taken for the union of that society with the First District Branch, as was suggested in the report of the Councilor last year. The work of the Medical Society of the County of Kings is too well known to require comment.

The meeting of the Second District Branch was held in the building of the Medical Society of the County of Kings, and at its close the County Society entertained those in attendance at an informal supper.

Your Councilor finds that the members of the Second District Branch are far more interested in the State Society than the single meeting which was held would indicate. The county members in particular place a high value upon their membership in the State Society, and the close union of the central society with the county societies has resulted in a rejuvenation of the local organizations. The city members have numerous societies of their own, and do not feel the need of an elaborate

meeting of the Branch, but they are showing a deep interest in the plans for the next meeting of the State Society.

Respectfully submitted,

FRANK OVERTON,
President Second District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE THIRD DISTRICT BRANCH.

To the House of Delegates:

The fifth annual meeting of this branch was held in Kingston, October 3, 1911, and was one of the most successful in the history of the branch. There was a large attendance at all sessions and as will be seen from the program, papers of unusual interest were read.

The county societies of this branch are all in fairly flourishing condition. More county bacteriological laboratories should be established to meet the demands of the present day practice of scientific medicine.

The following scientific program was rendered:

Demonstration in Cystoscopy, at Benedictine Sanitarium, J. N. Vander Veer, M.D., Albany; Demonstration of Medical and Surgical Patients by Local Physicians; President's Address, The Role of the Smaller Hospital, Mark O'Meara, M.D., Kingston; Radiography in Physical Diagnosis, A. MacFarlane, M.D., and A. F. Holding, M.D., Albany; discussion opened by E. E. Norwood, M.D., Kingston; Bullet Wound of the Abdomen; Report of Case of Bullet Wound of Sigmoid and Bladder during Acute Exacerbation of a Chronic Appendicitis, C. G. Hacker, M.D., Albany; Actual Condition of Vascular Surgery, Alexis Carrel, M.D., Rockefeller Institute, N. Y.; Psychotherapy in Organic Diseases, James J. Walsh, M.D., N. Y. City; discussion opened by A. Vander Veer, M.D., Albany; Chorio-Epithelioma with Report of Cases, C. O. Kepler, M.D., Boston; discussion opened by Mary Gage-Day, M.D., Kingston; Medical Ethics, Wisner R. Townsend, M.D., New York City; discussion opened by Frederick Snyder, M.D., Kingston.

The program also included a Public Health Meeting under the auspices of the Third District Branch of the Medical Society of the State of New York, the Medical Society of the County of Ulster, and the Public Health Committee of the Federation of Women's Clubs.

Remarks: The Plan of Co-operation of the State Department of Health, with County Medical Societies and other Agencies for the Promotion of Public Health, William A. Howe, M.D., Deputy Commissioner of Health, Albany.

Illustrated Lecture: "The Service of Biology in the Prevention and Cure of Infectious

Diseases," Veranus A. Moore, M.D., Cornell University.

The following officers were elected for the ensuing year: President, John B. Harvie, Troy; Vice-President, Robert Selden, Catskill; Secretary, William Kirk, Jr., Troy; Treasurer, Sherwood V. Whitbeck, Hudson.

Respectfully submitted,

MARK O'MEARA,

President Third District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE FOURTH DISTRICT BRANCH.

To the House of Delegates:

The Fourth District Branch annual meeting for 1911 was held at Ogdensburg, October 10th.

A scientific program occupied the morning and afternoon.

The different counties of the Fourth District Branch were well represented at the meeting.

The President of the Medical Society of the State of New York, Dr. Wendell C. Phillips, was present, and made an address which aroused much interest in the welfare of the State Society.

The meetings of the various county societies of the Fourth District Branch have been well attended and interesting programs have been presented.

Respectfully submitted,

GRANT C. MADILL,

President Fourth District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE FIFTH DISTRICT BRANCH.

To the House of Delegates:

The Fifth District Branch stands fourth in point of numbers, having five hundred and sixty members; the First, Second, and Eighth District Branches, in the order named, largely exceeding it in membership.

In accordance with the by-laws requiring the Councilor to visit each county society at least once during his term of office, I have found it possible to attend one meeting each in Jefferson, Oswego, and Madison counties, in addition to the meetings of the Medical Society of the County of Oneida (of which I am a member). The Councilor was received and treated most cordially on every occasion, and found the meetings well attended and furnishing most excellent programs. The interest in this Branch of the State Society, and its success, is eminently satisfactory. It is a

source of regret that conflicting engagements prevented visits to the societies of Lewis, Herkimer, and Onondaga, but it is to be hoped that the incoming president may find time and opportunity to attend the meetings of the societies omitted during the year just passed.

We have lost by death since the report of the preceding Councilor, several of our well-known members.

The fifth annual meeting of the Fifth District Branch was held at Utica, October 5, 1911. One hundred and sixty members were registered. A good delegation was present from the Madison County Medical Society, transferred, during the past year from the Sixth to the Fifth Branch, in accordance with their request presented at the annual meeting in Syracuse, October 19, 1910, and favored by action of the Fifth District Branch, permitting the granting of their request. The object of this transfer is the greater accessibility of the meeting places of the Fifth Branch to the members of the Madison County Medical Society by reason of more frequent steam and trolley service. An excellent luncheon was served by members of the Medical Society of the County of Oneida through its most efficient committee. The scientific program consisted of eleven papers and their discussion. Four of these papers formed a surgical symposium on injuries about the hip joint. Two others, read in conjunction by Drs. Hotaling and Groat, of Syracuse Medical College, on the "Urine of Pregnancy" involved some original work.

At the business meeting James K. Stockwell, of Oswego, was elected President; Amos P. Dodge, of Oneida, Vice-President; Frederick H. Flaherty, of Syracuse, was re-elected Secretary, and H. E. Hoyt, of Watertown was re-elected Treasurer for the coming year.

Respectfully submitted,

ARTHUR A. GILLETTE,

President Fifth District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE SIXTH DISTRICT BRANCH.

To the House of Delegates:

This branch in the main is doing good work with the exception of one or two counties which only hold their county meetings once a year and in which the physicians are situated, as a rule, far from each other; this makes getting together difficult, and but one meeting a year does not get up much enthusiasm for the society. However, the new officers of these societies are working to get at least two meetings a year. A plan which I would suggest, is to join two such counties where they

are contiguous and hold their meetings together. Better to have one strong society than two weak ones. Before my time expires I shall try to visit such societies and endeavor to get more push among its members.

Our Annual Meeting held the 6th of October at Elmira, was a great success and was largely attended from all over the district. Dr. Wayne Babcock, of Philadelphia, was with us and gave a fine address, also Dr. Wilson, of Buffalo. Dr. Howe, of the State Department of Health, gave a good address. It is an excellent thing to have with each branch at their annual meeting, some officer of the department to lay before the members the plan of working. It begets a friendly feeling between the Health Department and the profession and helps to educate physicians in their duties and familiarizes them with the methods of the department.

Our membership has increased in the district and I am sure a very good spirit prevails.

The counties of Schuyler, Chemung, Tioga, Broome and Otsego have been visited so far during the year and plans are on to visit all in the district before the year is over, either by the President or Secretary. All county societies in the district have been communicated with during the year.

I suggest that each county society be instructed to send each District Branch President and Secretary a copy of their meeting notices so they can plan to attend. As it is now, we have to write to find the time of meeting.

Dr. Frederick Miller, of Binghamton, was elected President; Dr. H. W. Fudge, of Elmira, Vice-President, and Dr. Luzerne Coville, of Ithaca, Secretary and Treasurer. The next meeting will be held in Binghamton.

Respectfully submitted,

SHERMAN VOORHEES,
President Sixth District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE SEVENTH DISTRICT BRANCH.

To the House of Delegates:

In making the usual report from the Seventh District Branch, it is with pleasure that I point to the fact that we had the largest meeting in the history of this branch. There were fifteen papers presented, all of which were of a high degree of excellence.

There was a banquet the evening preceding the meeting, at which the President of the American Medical Association, Dr. John B.

Murphy, and several other men of prominence from a distance responded to toasts.

Communication with the presidents and secretaries of the county societies brought to light some weak points, which we confidently expect will be corrected in the near future.

The next meeting will be held at Corning, N. Y., the second Thursday in September.

Officers elected were: Dr. H. B. Smith, Corning, President; Dr. W. D. Becker, Rochester, Vice-President; Dr. H. J. Knickerbocker, Geneva, Treasurer; Dr. J. F. Meyers, Sodus, Secretary.

Respectfully submitted,

WESLEY T. MULLIGAN,
President Seventh District Branch.

December 31, 1911.

REPORT OF THE COUNCILOR OF THE EIGHTH DISTRICT BRANCH.

To the House of Delegates:

Pursuant to law I herewith submit my report for the current year. Thus far I have succeeded in visiting four counties and expect to visit three more by the time this report is presented. Those visited were found to be in very satisfactory condition.

The annual meeting was held in Dunkirk, September 26 and 27 and was a decided success.

I would like to suggest the advisability of elaborating some method by which a speaker could be provided at the instance of the State Society, for at least one meeting a year in each county. I think this would have a tendency to cause country members to feel an interest in, and intimacy with the state organization which is now sometimes lacking. I feel that affairs in the Eighth District Branch are in a prosperous condition, but firmly believe that much might be done to cultivate a closer community of interest than now exists, especially in country districts.

The Eighth District Branch is to be congratulated in having for its President next year, Dr. H. A. Eastman, of Jamestown, whose single-hearted interest in matters pertaining to the profession is well known in this end of the state. The other officers elected were: First Vice-President, Arthur G. Bennett, Buffalo; Second Vice-President, Carl G. Leo-Wolf, Niagara Falls; Secretary, Carl Tompkins, Buffalo; Treasurer, Charles A. Wall, Buffalo.

Respectfully submitted,

T. H. McKEE,
President Eighth District Branch.

December 31, 1911.

SUPPLEMENTARY REPORT OF THE COMMITTEE ON THE REGULATION OF THE INTRODUCTION OF MEDICAL EXPERT TESTIMONY.

WHEREAS: Medical expert testimony is necessary and helpful to justice and ought to be effectively and freely used in the courts.

AND WHEREAS: The methods of legal procedure in trials involving medical expert testimony are now inefficient, and fail to utilize effectively expert knowledge and skill.

Therefore in order to promote an improvement in these conditions, this Committee asks the adoption of the following recommendations by the House of Delegates of the Medical Society of the State of New York.

As regards the legal side of the medical expert question we recommend:

1. That a freer use of appointments of commissions and of experts by the court.
2. That the medical expert should be paid by or through the court only, and not by either party to the action.
3. That a period of hospital or similar form of observation of persons, the nature of whose troubles is under dispute, be adopted as being the best method for securing impartial and accurate opinions; and we recommend the enactment in every state, of laws favoring such method.

As regards the medical side of the question we recommend:

4. That it be adopted as the opinion of the House of Delegates of the Medical Society of the State of New York that it is inadvisable and objectionable for any physician to occupy the position of medical advisory council in open court and at the same time to act as expert witness in a medico-legal case.
5. That it be adopted as the opinion of the House of Delegates of the Medical Society of the State of New York that the acceptance by a physician of a fee that is contingent upon the result of a medico-legal case, is not in accordance with sound medical ethics, is derogatory to the good repute of the profession and is injurious to the efficacy of expert testimony.

6. That the House of Delegates of the Medical Society of the State of New York adopt the following as a definite minimum standard of qualification for medical men giving expert testimony.

"That a physician should not be considered a medical or surgical expert in any special line, unless he is a graduate of a reputable medical college; has paid special attention for at least six years to the particular branch as to which he claims to be expert; has had opportunities of laboratory or clinical study or both, in that branch for at least four years, and is a member of a general and of a special medical society in good standing or special section of the same."

7. That the House of Delegates of the Medical Society of the State of New York recommend that all county medical societies of this state adopt these resolutions.

The following statement was also presented:

"STATEMENT OF THE EVILS OF THE PRESENT SYSTEM OF MEDICAL EXPERT TESTIMONY.

By JUDGE CLEARWATER, *North American Review*.

1. There are no satisfactory standards of expertness, and thus the testimony of charlatans is invited;
2. The character of the evidence often given by so-called experts is partisan and unreliable;
3. Trials are prolonged and their expense is increased on account of the number of witnesses;
4. The contradictory testimony of experts of apparently equal standing, having the same opportunities for acquiring knowledge of the facts, has a confusing effect upon juries;
5. Unprincipled self-styled experts are sometimes unscrupulously hired to support causes by specious and untruthful testimony;
6. Some trial judges are prone to permit incompetent so-called experts to testify to opinions predicted upon widely unrelated facts, and to express views which are but the speculative vagaries of ill-informed minds;
7. The expert must depend for compensation solely upon the litigant for whom he testifies;
8. The litigant who has the longest purse can produce the most imposing array of experts;
9. The Bench sometimes permits the Bar to treat the accomplished and modest expert with studied contempt;
10. Some trial judges are disposed to convert important trials into spectacular dramas which not infrequently descend to comedy and degenerate into farce, with the result that the administration of justice is degraded."

DWIGHT H. MURRAY, *Chairman*.

April 15, 1912.

REPORT OF THE COMMITTEE TO CONSIDER THE RECOMMENDATION OF CHANGES IN THE MEDICAL PRACTICE ACT.

"The House of Delegates at their meeting last April referred to this committee the following resolution:

Resolved, That the Board of Regents of the University of the State of New York be requested to recommend such change in the medical practice act as would raise the requirements for securing the medical student's certificate to include, in addition to the standard high school course, one year in college, or its equivalent, embracing especially the following subjects: physics, chemistry (inorganic and qualitative analysis), and general biology.

Resolved, That the State Society recommends to the Board of Regents that an investigation be conducted in order to ascertain the number of internships available in the hospitals of the state with a view to recommending a fifth year in hospital for the completion of the medical curriculum."

The committee, after having investigated the matter and given the same considerable attention, has arrived at the following conclusion:

That the standard of preliminary education for the degree of M.D. should be raised in the State of New York is, in the opinion of the committee, desirable.

That a hospital year is an excellent idea and much good would result from such a course. If, however, the state demands it, proper facilities for its execution are imperative.

That the State Society should at this time place itself on record as favoring a definite plan is, in the opinion of the committee, not advisable.

The committee, therefore, reports as follows:

"Whereas, due to circumstances over which the committee has had no control, it has been unable to meet or confer with the State Educational Department, and the deans of the various medical colleges, or to seek other sources of information.

Therefore, it does not feel warranted in making a final report upon a matter of so much importance to medical education, as the resolution referred to the committee for consideration involves.

Respectfully submitted,

H. M. HICKS,
FLOYD M. CRANDALL,
W. H. THORNTON.

April 15, 1912.

ANNUAL MEETING.

President Phillips called the One Hundred and Sixth Annual Meeting of the Society to order in the City Hall common council chamber at 10.30 A. M., April 16, 1912, for the transaction of scientific business, and stated that the first order was the reading of the minutes of last year.

The Secretary stated that these minutes were published in the JOURNAL for May, 1911.

On motion of Dr. Le Fevre, the minutes were accepted, as printed.

Dr. H. Sheridan Baketel presented his certificate as delegate to the Medical Society of the State of New York from the New Hampshire Medical Society.

As there was no other business to come before the society, it was moved that a recess be taken to reconvene at eleven o'clock in the Emmanuel Baptist Church.

Motion seconded and carried.

Meeting in the Emmanuel Baptist Church, called to order by President Phillips.

Prayer was offered by the Reverend Alex. H. Abbott, Pastor, Emmanuel Baptist Church.

At the conclusion of the invocation, President Phillips said: Ladies and Gentlemen: You are about to listen to the shortest president's address ever delivered before the Medical Society of the State of New York.

Upon my being elected to the office of president, it seemed to me that I could best serve the interests of the medical profession of this state by reorganizing the plan and nature and work of the scientific sessions of the society. I had long since conceived the idea that this great society, with its seven thousand members at its annual meetings, should make its sessions the clearing house for the scientific work which is accomplished by the noted men of our profession in our state, and with that object in view, and having been given authority by the council, I undertook to reorganize these sessions with the result which you see in the program, which has been presented for your consideration and deliberation during this session. The time that is usually spent in the preparation of the president's address was spent in constructive work in connection with this program. I leave it to you whether I had better gauge the profession by the work that has been done, or whether I might better have attempted to write a learned address.

Ladies and gentlemen, I wish to call your attention specifically to the consideration of the serious problems which are presented in the various sections of the programs of the Society, and bespeak your coöperation and support.

It is a great pleasure to preside over the deliberations of this body, and the work that has been accomplished by your House of Delegates during the past twenty-four hours, all men working at top speed, has been enormous, and yet, I believe, we have given due consideration to the matters which are foremost before ourselves and the people of this state from a public health and medical standpoint. So with these remarks we shall pass to the regular order of the work which is to follow.

So far as my recollection goes, this is the first time that the Governor of the State of New York has been present at the opening session of one of our annual meetings. It gives me great pleasure to welcome the Governor of this State, and to express the thanks of the members of this Society that he has consented to come here and deliver a short address of welcome to our Capital City.

I take great pleasure in introducing to you the Hon. John A. Dix, Governor of the Empire State.

Governor Dix said: Mr. President, Ladies and Gentlemen: As my good friend, the Mayor, is here to give you a welcome to Albany, to extend to you the keys of the city, as an Albanian, I wish to greet you and extend a welcome of the individuals of Albany and of the State. Your com-

ing here annually for the purpose of deliberation, consultation, and consideration of important subjects is to my mind a step in the direction of true coöperation and progress in one of the greatest sciences, that of medicine and surgery. Time was—when Albany was an outpost located or designated by the Hollanders—when the clergy and the medicine man or physician had controversies, discussions, and differences. Your meeting here today, I think, has done away with that animosity of differences because your meeting in this church is an evidence of harmony.

Until the year 1642 the surgeon and the barber were one, but as the world moves and progress is being made in the lines of every human endeavor, there has been no greater accomplishment in any research than in that of medicine and surgery. It has now become almost an exact science. It has become so only through the work and unselfish devotion of those who are giving their lives and their efforts to the amelioration of suffering. That progress in this country is coöperated in by the study and research of other countries, and I am proud to say in this State of New York in the City of Albany there are those who have taken high rank in the profession, whose names will forever live in the annals of research, of industry and of accomplishment. Your welcome to Albany, I believe, is two-fold: First, your interest in the profession; second, the attitude you have toward each other to accomplish what is best for human life, in the research of nature's secrets, which go to make up a strong nation of individuals. I trust that in your deliberations that even greater harmony will result, that the accomplishment for good will be continued, and with these expressions of my wishes for your happiness, your success, I desire only to add that Albany will forever extend to you that hearty welcome, believing as I know she does that good is accomplished by your coming here.

PRESIDENT PHILLIPS: We are to have an address of welcome from the Mayor of the City of Albany. Word came to me from the Mayor that he always got seasick if he had to appear in public, and I wish to say to the Mayor, he will be well cared for if he has an attack this morning.

We are honored by the presence of Hon. James B. McEwan, Mayor of the City of Albany, who will deliver an address of welcome.

ADDRESS OF WELCOME BY MAYOR MCEWAN.

Mr. President, Ladies and Gentlemen: The usual symptoms have not developed, and I think it is because, like the patient going into the office of the dentist, the pain ceases when he looks at the face of the dentist or the instruments.

I desire to supplement the words of welcome uttered by the Governor, although I believe your frequent coming here rather obviates the necessity of a formal welcome. The majority of you

have been here frequently, and I trust you will feel perfectly at home in this city. But as a living example of the great success of modern surgery, I take peculiar pleasure in expressing to the fraternity at large and to one particular member of your society, who is here present, my deep sense of gratitude for the skill, the courage and the care which brought me through a trying period and enables me to stand here and bid you not only an official but very, very hearty welcome to Albany.

PRESIDENT PHILLIPS: The young man whom I am about to announce as the next speaker I ask you to pay deference to, because of his youth and because of his timidity. Inasmuch as he has never spoken in public before, I feel I am obliged to ask this favor of you. Eighty-three years young is the term that may be well applied to our beloved friend, or better still the introduction that has been used many times before, eighty years of a pure life are about to address you. Could I say more than to remark that we welcome Abraham, the beloved, who will bring to us a word of greeting from the American Medical Association.

I take great pleasure in introducing to you Dr. Abraham Jacobi, President of the American Medical Association.

Dr. JACOBI said: Your Honor, Mr. President, Ladies and Gentlemen: It looks after all as if I were not a stranger here, judging from the united reception you have given me. Thirty years ago I was the president of this Medical Society of the State of New York. Ten years ago I became a member of the joint committee which finally readjusted our relations with the largest medical body in the world, the American Medical Association. Six years ago our Society recovered its legitimate connection with that great body. That was accomplished, as some of you will remember, after the Association had so modified its principles of ethics as to render them acceptable both to us and the great national body in which we then received a hearty welcome. Its good will toward the State of New York was fully reëstablished, and finally demonstrated by the election of one of us to its presidency.

Now, the American Medical Association sends through me, its greetings to this, its largest constituent body which, under the guidance of our present president, is entering upon important changes in its activities, with the hope that the contemplated alteration of its scientific arrangements will strengthen the ties which have bound you and me to this our powerful and harmonious Society, will add to the variety and usefulness of its proceedings, thereby increasing our registration, and multiply the number of our scientific contributions and the facilities it offers to the individual practitioners of the state and country through the joint influence of the newly formed sections.

Our mother association furnishes an example of success which is greatly due to the very efficiency of its many sections, composed of members gathered from forty-eight states and their state organizations. That is why the American Medical Association, even more than the congress of the United States, supplies a fruitful example of national harmony and prosperity and a certainty of an ever increasing importance in the enforcing of universal sanitation and national legislation enacted in the interest of the American people. This, our state Society, even now the largest contingent of the American Medical Association, may exert a still more beneficent action than before, for only one-half of our seven thousand fellows are at present members of the American Medical Association. The other half is, however, entitled to membership. Even now sixteen hundred copies of the *Journal of the American Medical Association* are taken by our fellow colleagues who, by applying for membership, will have their journal free by merely paying the subscription price as their annual dues. By so doing, you lose nothing but gain much. The cause of this, our state Society, is identical with that of the Medical Association which, by adding to its roster 3,500 names of Fellows of the Empire State Society, will increase the weight and influence of this Society in national problems.

The American Medical Association has engaged in many of the battles undertaken for the welfare of the American people. A full representation in its ranks of this our intelligent and influential medical body is sure to prove successful. What we want for that end is union, for there is no healthy progress without the co-operation of all. There are many organs in the body, but only one organism; many sects and schools, but only one medicine; many professions and occupations and trades, but only one commonwealth, and there are forty-eight states, with the growing tendencies of developing into a nation. Join together and be strong. By joining the American Medical Association in vastly increasing numbers, we shall succeed in lightening the burden it is ready to carry in the service of the people. The nationalization of local medical problems, the suppression of obscurantism and of the coarse mixture of many species of financial greeds conspiring under the captivating term of "medical freedom," the foundation of a national bureau or department of health and the uniformity of national methods of medical education and practice will to a great part depend on your active sympathy, which must take the place of occasional indifference, sometimes even amounting to indolence. All of us should share, however, like ancient Romans, the pride of national citizenship in the profession and in the country, coupled with a sense of national obligation. With that program inscribed upon our flag, the American Medical Association invites us all to meet at Atlantic City.

PRESIDENT PHILLIPS: There is an old saying that all the world loves a lover. I wish to change that to suit our present conditions by saying that all the world loves a fighter. It is a great pleasure to welcome to this convention the next speaker, who will deliver the annual oration on medicine. It is the first time I have had the pleasure of meeting Dr. Wiley, and after I studied his stature, I began to see that he was well fitted for the great fight which he has made in the interests of the public health of this great nation. We honor ourselves today in honoring Dr. Wiley. We bid him welcome to this Society, and we wish him to understand it is not only our desire that we may hear the oration which he has prepared for this occasion, but also that we may stamp our approval upon his work and upon the great fight which he has made for pure food in America. It is a great pleasure to me to introduce Dr. Harvey W. Wiley, former Chemist and Chief, Bureau of Chemistry, Department of Agriculture, Washington, who will now deliver the annual oration on medicine.

Dr. Wiley selected for his oration, "Relation of Exact Science in Medicine." (See page 222.)

At the conclusion of Dr. Wiley's address on motion of Dr. Albert Vander Veer, a rising vote of thanks was extended to Dr. Wiley for his splendid and scholarly address.

After announcements by the local Committee of Arrangements as to the places of meetings of the various sections, the meeting adjourned.

General meeting in the Assembly Chamber, State Capitol, April 16th, open to the public.

After the calling of the meeting to order at 8.30 P. M., by the President, Dr. W. C. Phillips, the following papers were read:

"Prevention of Insanity," Albert Warren Ferris, M.D., Watkins, N. Y.

"The Present Status of the Movement for the Prevention of Tuberculosis in this State," Homer Folks, Esq., State Charities Aid Association, New York.

"Prevention of Deafness and the Instruction of the Deaf Child," G. Hudson Makuen, M.D., Philadelphia, Pa.

"Prevention of Blindness and the Instruction of the Blind Child," George E. de Schweinitz, M.D., Philadelphia, Pa.

General meeting, Emanuel Baptist Church, April 17.

After the calling of the meeting to order by the President, Dr. Phillips, at 2 P. M., the annual oration on surgery, "The Duty of the Family Physician in the Management of Surgical Cases," was delivered by John M. T. Finney, M.D., Assoc. Prof. of Surgery Johns Hopkins University, Baltimore, Md. (See page 228.)

General meeting in the Assembly Chamber, April 17th, open to the public.

After the calling of the meeting to order, at 8.30 P. M., by the President, Dr. W. C. Phillips, an address was delivered by Prof. W. B. Cannon,

of Harvard University, entitled, "Animal Experimentation and its Benefits to Mankind." (See page 213.)

The Scientific Program was carried out as published in the March, 1912, issue of the JOURNAL, pages 145-150 with the following exceptions:

SECTION ON MEDICINE.

The following papers were not read:

"The General Care of an Emphysematous Patient," William M. Gibson, M.D., Utica.

"Eczema in Infants and Young Children," Charles G. Kerley, M.D., New York City.

"Rice in the Dietary of the Diabetic," Heinrich Stern, M.D., New York City.

SECTION ON SURGERY.

The following papers were not read:

"X-ray Pictures of the Kidney," Edward L. Keyes, Jr., M.D., New York City.

"Superapubic Prostatectomy," Paul M. Pilcher, M.D., Brooklyn.

"Control of Hemorrhages in Operations Upon the Liver," Burton J. Lee, M.D., New York City.

"Epithelioma of the Eyelids," S. Busby Allen, M.D., Patchogue.

New paper read:

"Diagnosis and Treatment of Intestinal Obstruction," Clarence A. McWilliams, M.D., New York City.

SECTION ON DISEASES OF THE EYE, EAR, NOSE AND THROAT.

The following papers were not read:

"Palate and Lip Surgery; Aims and Results," Truman W. Brophy, M.D., Chicago, Ill.

(a) "Acute Frontal Sinusitis with Orbital Perforation and Meningitis. Operation—Recovery."

(b) "Chronic Frontal Sinusitis with Erosion of Inner Cranial Plate and Extra Dural Abscess. Operation—Recovery," Seymour Oppenheimer, M.D., New York City.

SECTION ON MENTAL AND NERVOUS DISEASES, EUGENICS AND MEDICAL EXPERT TESTIMONY.

The following papers were not read:

"Paralytic Complications of Migraine," J. Ramsay Hunt, M.D., New York City.

"Some Notes on the Compulsion Neuroses," Smith Ely Jelliffe, M.D., New York City.

"Medical Expert Testimony from the Alienist's Standpoint," Carlos F. MacDonald, M.D., New York City.

"Medical Expert Testimony from the Justice's Standpoint," Hon. Randall J. Le Boeuf, Albany, former Justice of the Supreme Court of New York.

New paper read:

"Medical Expert Testimony," Eugene H. Howard, M.D., Rochester, N. Y.

SECTION ON PUBLIC HEALTH AND PREVENTIVE MEDICINE.

The following papers were not read:

"Prophylaxis in Diphtheria," Franklin C. Gram, M.D., Buffalo, N. Y.

"State vs. National Quarantine," Algernon T. Bristow, M.D., Brooklyn, N. Y.

"Public Health and Public Recreation," Luther H. Gulick, M.D., Russell Sage Foundation, New York City.

"Pollution of the Harbor Waters of New York, Especially Referring to Bearing on Health," Lin-
sly R. Williams, M.D., New York City.

"The Significance of the Physician of Physiological Age," Charles W. Crampton, M.D., New York City.

WISNER R. TOWNSEND,
Secretary.

HOUSE OF DELEGATES.

The regular annual meeting of the House of Delegates of the Medical Society of the State of New York was held in the City Hall, Albany, April 15, 1912, at 8.50 P. M. Dr. Wendell C. Phillips, president, in the chair; Dr. Wisner R. Townsend, secretary.

On the roll call the following delegates answered to their names:

S. R. Morrow, L. H. Neuman, S. B. Ward, E. W. Ayars, A. S. Chittenden, F. C. Beals, C. L. Lang, F. C. Rice, P. B. Brooks, Z. F. Dunning, F. D. Reese, J. W. Poucher, W. H. Thornton, E. Clark, A. T. Lytle, J. H. Pryor, J. Richter, J. Ullman, J. F. W. Whitwell, P. F. Dalphin, M. P. Messinger, G. Lenz, W. G. Rommel, S. S. Richards, F. B. Smith, E. H. Bartley, M. L. Bodkin, W. C. Braislin, W. Browning, W. B. Chase, L. J. J. Commiskey, J. M. Winfield, C. N. Cox, J. W. Fleming, S. H. Lutz, J. C. Hancock, J. R. Kevin, G. McNaughton, P. M. Pilcher, J. O. Polak, J. S. Read, C. G. Crane, J. E. Sheppard, J. R. Stivers, W. Truslow, J. P. Warbasse, W. M. Brown, L. W. Howk, W. E. Bowen, N. D. McDowell, O. E. Jones, H. M. Hicks, E. Altman, L. F. Bishop, W. L. Carr, F. M. Crandall, E. P. Fowler, H. Fox, E. E. Harris, I. S. Haynes, W. B. Hoag, H. S. Houghton, E. Le Fevre, F. W. Loughran, J. J. MacPhee, J. M. Mabbott, M. S. Macy, R. S. Morton, S. Oppenheimer, A. Parry, C. H. Richardson, G. R. Satterlee, H. M. Silver, T. S. Southworth, I. D. Steinhardt, J. P. Tuttle, J. E. Weeks, B. H. Wells, L. R. Williams, J. V. D. Young, W. A. Scott, C. Bernstein, F. J. Douglas, H. G. Jones, H. L. Elsner, F. H. Flaherty, D. H. Murray, W. W. Skinner, E. C. Thompson, H. L. Winters, E. Munson, W. H. Kidder, J. H. Lyons, S. W. S. Toms, G. C. Madill, W. B. Hanbidge, J. T. Sweetman, Jr., H. G. Hughes, C. S. Best, J. K. King, F. W. Lester, B. R. Wakeman, O. K. Stewart, A. C. Loper, C. S. Paine, H. Van Hoevenberg, T. H. Hallett.

The following names were presented by the New York Delegation and declared by the President entitled to sit as delegates:

Dr. S. J. Kopetsky in place of Dr. D. Bovaird, Jr., absent; Dr. G. H. Fox in place of Dr. L. A. Conner, absent; Dr. P. B. Van Voast in place of Dr. J. B. Squier, absent, and Dr. S. G. Gant in place of Dr. R. Stein, absent.

The following officers and chairmen of committees were present:

Wendell C. Phillips, President; William Francis Campbell, Second Vice-President; Wisner R. Townsend, Secretary; Alexander Lambert, Treasurer; Leo H. Neuman, Chairman Committee on Scientific Work; Joshua M. Van Cott, Chairman Committee on Public

Health, also the following Councilors—William S. Gleason, First District Branch; Frank Overton, Second District Branch; Grant C. Madill, Fourth District Branch; Arthur A. Gillette, Fifth District Branch; Wesley T. Mulligan, Seventh District Branch; Thomas H. McKee, Eighth District Branch.

A quorum having answered to their names on the roll call, President Phillips declared the meeting open for business, and stated that the first order was the reading of the minutes of the previous meeting by the Secretary.

THE SECRETARY: The minutes were printed in the May, 1911, issue of the NEW YORK STATE JOURNAL OF MEDICINE.

It was moved that the minutes be accepted as printed. Motion seconded and carried.

THE PRESIDENT: The next order is the reading of the President's report. Ladies and Gentlemen: It is the desire of the President and other officers that the business of this Society shall be transacted with celerity, and that there shall be no time lost. The President's report is printed and in your hands, and I have no doubt has been read by all of you, and while it would give your President great pleasure to read it, he has decided to set a good example for brevity, and not read it unless it is called for. It is hoped that every member will follow the example of the President in all of his remarks and try to be as brief as possible. (For Report see page 247.)

DR. E. ELIOT HARRIS: I move that the Secretary read the recommendations made by the President in his report, in order that this house may act upon them. In times past we have appointed a committee to consider the reports of officers, and they have never had time to report back to this house. Therefore, I move that the Secretary read the recommendations in the report for action by this house tonight.

Motion seconded.

THE PRESIDENT: The chair regrets such a motion, for the reason that it is desirable that a committee be appointed at the present time to consider and present at the meeting tomorrow morning, the recommendations in the President's report and those that may be contained in other reports.

DR. HARRIS: After what you have said, Mr. President, I withdraw my motion and move that a committee of five be appointed to consider the recommendations in the President's report, and any other reports that may be referred to it and that said committee report at the regular session of the House of Delegates tomorrow morning.

Motion seconded and carried.

The chair appointed on the Committee Dr. Egbert Le Fevre, Chairman, New York; Dr. Charles W. Richardson, New York; Dr. Charles N. Cox, Brooklyn; Dr. Grant C. Madill, Ogdensburg, and Dr. George C. Cott, Buffalo.

THE PRESIDENT: The next is the annual report of the Council. (See page 254.)

DR. LE FEVRE: I move that the report be accepted as printed.

Motion seconded and carried.

THE PRESIDENT: The next order of business is the report of the Secretary. (See page 251.)

DR. LE FEVRE: I move that the report be accepted as printed, and that the recommendations contained therein be referred to the Committee on President's Address.

Motion seconded and carried.

It was likewise moved, the motion being seconded and carried, that any recommendations contained in other reports be referred to the Committee on President's Report.

THE PRESIDENT: The next order is the report of the Treasurer, Dr. Alexander Lambert. (See page 252.)

It was moved that this report be accepted as printed.

Motion seconded and carried.

THE PRESIDENT: The next is the report of the Council. (See page 259.)

DR. HARRIS: I move that this report and all other printed records be accepted as printed. (See pp. 261-265.)

(Reports accepted as printed consist of—Committee on Publication appointed by the Council, Committee on Public Health, Committee on Legislation, Committee on Experimental Medicine, Committee on Scientific Work, Committee on Arrangements, Committee on Uniform Membership, and the reports of the eight District Branch Councilors.)

DR. DWIGHT H. MURRAY: In connection with the report of the Committee on the Regulation of the Introduction of Medical Expert Testimony, as printed, I desire to say that the New York Academy of Medicine has taken the matter up, has appointed a committee, and adopted certain resolutions. On Friday night I met with some of the members of that committee, and it was requested that this Society adopt resolutions in connection with this matter, which I will read, or the Secretary can do so. We have a printed recommendation which should be placed in the hands of the Committee on President's Report. (See page 265.)

DR. SAMUEL B. WARD: I heartily recommend the adoption of the resolutions.

Motion seconded by several delegates.

DR. EMIL ALTMAN: I move that this report be laid on the table.

The motion to lay the report on the table was seconded, but on being put to vote was declared lost.

DR. HARRIS: I move that this report and the resolutions be referred to the Committee on President's Report.

Motion seconded and carried.

It was moved that any supplementary report that might be made in reference to expert testimony be likewise referred to this committee.

Motion seconded and carried.

Resolved, That the Committee be continued and constituted as follows:

Drs. Dwight H. Murray, Edward D. Fisher, Algonon T. Bristow, Charles L. Dana, and be it further

Resolved, that the Committee be empowered to increase its membership not to exceed nine members.

Motion seconded and carried.

THE PRESIDENT: Any further reports containing recommendations will be referred to the Committee on President's Report.

Dr. Hicks presented a report with reference to recommending changes in the Medical Practice Act: (See page 265.)

THE PRESIDENT: What is your pleasure with regard to this report?

It was moved that the report be referred to the Committee on President's Report.

This motion was seconded, and on being put to vote was declared lost.

DR. HARRIS: I move that the report be adopted.

Motion seconded.

DR. F. M. CRANDALL: I move as a substitute that the committee be enlarged to five for further consideration of this matter and that it report next year.

The substitute was seconded, accepted, and on being put to the house was declared carried.

Under the head of "Unfinished Business," the Secretary read the following report from the Committee on Prize Essays:

Albany, April 15th, 1912.

We, the undersigned Committee on Prize Essays, would respectfully report that but two essays have been received. While both are possessed of many points of merit and commendation, yet we do not believe they are quite equal to the high standard required for the awarding of such a prize.

Respectfully yours,

(Signed) A. VANDER VEER,
JOHN F. W. WHITBECK,
EDWARD D. FISHER.

It was moved that the report be accepted.

Motion seconded and carried.

THE PRESIDENT: Is there any further unfinished business?

THE SECRETARY: There is a proposed amendment to amend Chapter VIII, Section 1, of the By-Laws, taking Steuben County from the Seventh District Branch and placing it in the Sixth District Branch.

DR. B. R. WAKEMAN: I move that this amendment be laid upon the table for another year.

Motion seconded and carried.

THE SECRETARY: Action is now before the house to change the time and place of the annual meeting.

THE PRESIDENT: This will require two motions. The first is, Shall we change the time of the annual meeting?

DR. HARRIS: I move that we meet at the same time next year.

Motion seconded.

DR. LE FEVRE: I move to amend that the time of meeting be the last Tuesday in April.

Motion seconded.

DR. HARRIS: I accept the amendment.

DR. ALTMAN: I would further amend the original motion by making it some time in February and that the matter be referred to a committee for consideration.

This amendment was not seconded.

The original motion as amended was put and declared carried.

THE PRESIDENT: The next item is the place of meeting for next year.

Dr. William N. Brown extended an invitation to the society, on behalf of the Medical Society of the County of Monroe to hold its next annual meeting in Rochester, and moved that the meeting be held on the last Tuesday in April in accordance with the motion previously adopted.

Motion seconded and carried.

The Secretary announced that he had received letters of invitation from the Medical Society of the County of Monroe, The Rochester Academy of Medicine, The Hospital Medical Society of Rochester, The Rochester Pathological Society, The Rochester Chamber of Commerce, and the Mayor of Rochester.

DR. HARRIS: According to Article VI, Section 1, of the Constitution, it is necessary to give notice at a preceding meeting for action to be taken upon the time and place of meeting at the subsequent meeting, and I, therefore, give such notice, Mr. President.

THE PRESIDENT: The next matter under the head of "Unfinished Business" is the report of the Board of Censors.

The Secretary presented the following report:

A meeting of the Board of Censors of the Medical Society of the State of New York was held at the offices of the Society, 17 West 43rd Street, May 19th, 1911.

Present: Drs. Wendell C. Phillips, A. A. Gillette, W. S. Gleason, T. H. McKee, G. C. Madill, W. T. Mulligan, Frank Overton and Wisner R. Townsend.

As the meeting had been called for 2 P. M., and the President had not appeared at 2.15 P. M., Dr. Mulligan was called to the chair to preside.

Upon motion by Dr. Townsend, seconded by Dr. Madill and duly carried, Dr. Mulligan explained that the reason for the meeting was to hear the appeal of Drs. G. C. Reid, W. B. Reid, J. O. Stranahan and J. E. Groff.

Mr. Lewis appeared as counsel for the State Society; Mr. Searls for Drs. G. C. Reid, J. O. Stranahan, and J. E. Groff, and Mr. Stevens for Dr. W. B. Reid. Drs. F. H. Peck, President, and W. B. Roemer, Secretary of the Oneida County Society, F. J. Douglas, Chairman, and H. G. Jones, Secretary of the Oneida County Board of Censors, appeared for the Medical Society of the County of Oneida.

Dr. Townsend moved, Dr. Mulligan seconded and it was duly carried, that Dr. Gillette of the Oneida County Society be excused from participating in the deliberations and from voting.

Dr. Phillips arrived at 2.25 P. M., presented his apologies for an unavoidable delay and presided during the rest of the meeting.

Recess was taken at 5.30 until 8.30 P. M. Meeting of the evening was resumed at 8.50 and adjourned at 11.15 P. M.

At the evening session the following were present: Drs. Wendell C. Phillips, A. A. Gillette, W. S. Gleason, T. H. McKee, G. C. Madill, W. T. Mulligan, Frank Overton, and Wisner R. Townsend.

Dr. Gillette was excused at 9.30 P. M.

After listening to everything relating to the case, the following resolution was moved by Dr. Madill, seconded by Dr. Townsend, and carried—

Resolved, That a copy of the proceedings and the briefs of the counsel, and the Oneida County By-Laws be sent to each member of the Council for his personal study.

Moved by Dr. Townsend, seconded by Dr. McKee and carried, that the next meeting of the Board of Censors be held at the same time as the Council meeting, which is to be held in December.

Upon motion duly seconded and carried, the Censors then adjourned.

(Signed) WISNER R. TOWNSEND, *Secretary*.

A meeting of the Censors was held at 1.20 P. M. on December 15, 1911, at the rooms of the State Society, 17 West 43rd Street.

Present: Drs. Wendell C. Phillips, Wisner R. Townsend, Frank Overton, Mark O'Meara, G. C. Madill, Sherman Voorhees, W. T. Mulligan, and T. H. McKee.

A telegram was received from Dr. Gleason explaining his absence, and a letter from Dr. Gillette. On motion duly seconded and carried, the absentees were excused.

The minutes of the last meeting were read and approved.

After full discussion the following report was unanimously adopted:

In the Matter of the Appeal to the
MEDICAL SOCIETY OF THE STATE OF
NEW YORK,

—of—

GEORGE C. REID, J. ORLEY STRANAHAN,
WILLIAM B. REID and JOHN E. GROFF.

From the action taken by the MEDICAL
SOCIETY OF THE COUNTY OF ONEIDA,
expelling them from membership
therein.

Whereas, charges were formulated against George C. Reid, J. Orley Stranahan, William B. Reid and John E. Groff, duly licensed physicians and surgeons of the County of Oneida and the State of New York, and members of the Medical Society of the County of Oneida and the Medical Society of the State of New York, wherein and whereby it was alleged that the foregoing had permitted certain advertisements to appear in a certain local so-called industrial booklet or pamphlet, and

Whereas, upon such charges the foregoing appellants were expelled from membership in such County Society and in the Medical Society of the State of New York, and

Whereas, the above named appellants feeling themselves aggrieved at such expulsion, in that they were prejudiced in certain respects in connection with the charges themselves, the manner of trial and the resulting action of the Medical Society of the County of Oneida expelling them from membership therein, have duly and regularly appealed from said action of the Medical Society of the County of Oneida to the Medical Society of the State of New York, and

Whereas, under the provisions of the Charter and By-Laws of the Medical Society of the State of New

York, such charges being of an ethical nature, the matters involved in said appeal were duly and legally referred to the Board of Censors of the Medical Society of the State of New York, and

Whereas, a meeting of the Board of Censors of the Medical Society of the State of New York, duly called, was held on the 19th day of May, 1911, at the Academy of Medicine, No. 17 West 43rd Street, in the City and County of New York, upon due and legal notice to each of said appellants, and upon due and legal notice to the Medical Society of the County of Oneida, and

Whereas, each of said appellants and the Medical Society of the County of Oneida were present at such meeting and offered testimony in respect to said appeal, and

Whereas, pursuant to the Charter and By-Laws of the Medical Society of the State of New York, it becomes necessary for such Board of Censors of the Medical Society of the State of New York to submit its findings to the Medical Society of the State of New York at its next ensuing annual meeting, and due deliberation having been had thereon,

The board of Censors of the Medical Society of the State of New York, at a duly and legally called meeting thereof, held at No. 17 West 43rd Street in the City of New York, on the 15th day of December, 1911.

FIND AS FOLLOWS:

I. That the charges preferred against the appellants are within contemplation of the provisions of the Charter and By-Laws of the Medical Society of the County of Oneida, or within the provisions of the Principles of Medical Ethics of the American Medical Association, which Principles of Medical Ethics is a constituent part thereof, and that the charges as formulated against each of the foregoing appellants are proper subjects for investigation and discipline.

II. That those who had the matter in charge, legally and in due time brought charges before the Board of Censors of the Medical Society of the County of Oneida, for hearing.

III. That under the provisions of the Constitution and By-Laws of the Medical Society of the County of Oneida, a report of the Censors of such Society, having the matter in charge, was not made to the Medical Society of the County of Oneida, "at the next meeting" as therein provided.

IV. As the Board of Censors of the Medical Society of the County of Oneida omitted to report at the next regular meeting of the Medical Society of the County of Oneida, as provided in its By-Laws, the accused should have been, but were not, adequately notified when the charges against them were actually to be heard by the Medical Society of the County of Oneida.

Dated, New York, December 15, 1911.

On motion of Dr. McKee, seconded by Dr. Madill, the Secretary was instructed to notify the appellants and their attorneys and the Medical Society of the County of Oneida that the Censors would be ready to report to the House of Delegates at its next meeting, which will be held in Albany, beginning Monday evening, April 15th, 1912.

(Signed) WENDELL C. PHILLIPS, *President*
WISNER R. TOWNSEND, *Secretary*
GRANT C. MADILL
WESLEY T. MULLIGAN
T. H. MCKEE
FRANK OVERTON
SHERMAN VOORHIES

The Secretary then read the following:

In the Matter of the Appeal from The
Decision of the MEDICAL SOCIETY OF
THE COUNTY OF ONEIDA

—of—

DR. J. ORLEY STRANAHAN, DR. GEORGE
C. REID, DR. WILLIAM B. REID and
DR. JOHN E. GROFF, *Appellants*.

To the Medical Society of the State of New York and the House of Delegates of said Society:—

The above named physicians having appealed from the decision of the Medical Society of the County of Oneida by notice of appeal served April 17th, 1910, and such appeal having been pending unheard and undetermined ever since during which time said appellants have been unjustly deprived of membership, hereby demand that said appeal be heard and determined as required by Section 5, Chapter III, of the By-Laws of said Medical Society of the State of New York.

Said appellants protest against reference or delegation of said appeals to the Board of Censors or any other committee, board or body or the determination of said appeal upon any report of such board; or body as being unauthorized and illegal.

The said appellants respectfully demand that they and each of them be heard upon said appeals and that reasonable opportunity be given appellants to be heard by counsel.

Dated, April 15th, 1912.

(Signed) J. O. STRANAHAN
J. E. GROFF
GEORGE C. REID
W. B. REID

THE PRESIDENT: You have heard the report of the Board of Censors. What is your pleasure?

DR. MARTIN L. BODKIN: I move that the report be adopted.

Motion seconded.

DR. H. G. JONES: I desire to move as an amendment that the action of the Medical Society of the County of Oneida in expelling the members named in the report be confirmed and adopted by this body.

THE PRESIDENT: The chair declares the amendment out of order.

After a discussion by Doctors Harris, Tuttle, Jones, Douglas and Mr. Lewis, the motion to adopt the report was put and carried.

DR. S. B. WARD offered the following:

Whereas, It appears by the findings of the Board of Censors of the Medical Society of the State of New York that the appellants herein, George C. Reid, J. Orley Stranahan, John E. Groff and William B. Reid, were not duly, legally and adequately notified of the meeting of the Medical Society of the County of Oneida, at which meeting action was taken upon the findings of the Board of Censors of said County Society in respect to said appellants,

Resolved, That the Medical Society of the State of New York hereby respectfully requests that at the next regular meeting of the Medical Society of the County of Oneida, and upon due notice in writing to each of the appellants herein, action by said County Society upon the report of the Censors of the Medical Society of the County of Oneida, in respect to the charges heretofore made against George C. Reid, J. Orley Stranahan, John E. Groff and William B. Reid, appellants, be taken *de novo* as though no action upon said Board of Censors's report had been heretofore taken.

THE PRESIDENT: This resolution is before you.

It was moved and seconded that the resolution be adopted.

After discussion by Drs. Douglas, Jones, Harris, Le Fevre, Dr. Jones moved that the consideration of the resolution be deferred until Tuesday morning's session of the house.

Motion seconded and carried.

THE PRESIDENT: Is there any further unfinished business? If not, the next order is new business.

THE SECRETARY: I have before me an appeal from Dr. Kunitzer.

IN THE MATTER

—of—

The alleged expulsion of ROBERT KUNITZER, from membership of the COUNTY MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

TO THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, AND TO THE HOUSE OF DELEGATES THEREOF:

GENTLEMEN:—

Please Take Notice that the undersigned hereby appeals to the Medical Society of the State of New York and to the House of Delegates thereof from the action taken by the Medical Society of the County of New York and the officers thereof, on December 27th, 1910, and from the ruling of the chair, that the undersigned was expelled from membership therein, by the vote of the Society taken on that occasion; and the appellant submits herewith and makes a part of this appeal a verified statement of the facts concerning the alleged expulsion hereby appealed from.

Dated, New York, March 12th, 1912.

Yours, etc.,

ROBERT KUNITZER, M.D.,
Appellant.
A. S. GILBERT,
Attorney for Appellant,
43 Exchange Place,
New York City.

DR. HENRY L. ELSNER: I move that this matter be referred to the Board of Censors.

Motion seconded and carried.

THE PRESIDENT: Is there any further new business to come before the house?

DR. JOHN W. POUCHER: I have a communication which I desire to present to the House of Delegates at this time from the Medical Society of the County of Dutchess.

At the regular meeting of the Medical Society of the County of Dutchess, held April 12, 1911, the following resolutions were adopted:

Whereas, We consider it impracticable and impossible for the average sized county medical society to secure the enforcement of the laws regulating the practice of medicine; therefore, be it

Resolved, That our delegates to the State Society be directed to bring this matter to the attention of the House of Delegates, with the intent that the enforcement of such laws be assumed by the State Society;

Resolved, That the Secretary send copies of these resolutions to each of the County Medical Societies in this State.

THE PRESIDENT: What will you do with these resolutions?

It was moved that the resolutions be adopted.

After discussion by Doctors Scott, Ayars and Mabbot, the motion was put and the resolutions declared adopted.

DR. CHARLES W. RICHARDSON: The resolution which I am about to offer was adopted at a meeting of the Medical Society of the County of New York, and by separate motion the delegates were directed to present the resolution to this body for its endorsement.

The resolution is as follows:

Whereas, The Honorable Commissioner of Education of the State of New York has suggested in a memorial to the Regents "That the board advise the practice of

legislative discrimination between the requirements in the scientific training of those who only manipulate the body, those who only prescribe medicines, those who perform simple external operations, and those who perform major operations in surgery; that whenever this program involves amendments to the Medical Practice Act, the legislature be requested to enact them," and

Whereas, The Medical Society of the State of New York believes that such a plan would not be for the best interest of the public and the profession,

Resolved, That the Medical Society of the State of New York protests against any such change and recommends that a copy of this resolution be sent to the Board of Regents.

Motion seconded and carried.

The Secretary presented a communication from Dr. Frederick R. Green, Secretary of the Council on Health and Public Instruction of the American Medical Association, stating that if the Medical Society of the State of New York desired speakers on health problems for cities or towns, and would pay all the expenses except speakers' salaries, the American Medical Association would furnish the speakers.

On motion, the communication was placed on file.

Dr. Harris referred to the recommendations of the Medical Society of the County of New York for additions to the medical law, making the following misconduct a cause for the revocation of the license to practice medicine in this state:

1. A wilful betrayal of the professional secret to the detriment of the patient.
2. All advertising of medical business in which grossly improbable statements are made, or all advertising of medical business which is intended or has a tendency to deceive the public or impose upon the credulous or ignorant persons, or to be harmful or injurious to public health or morals.
3. Having professional connection with or lending one's name to an illegal practitioner of medicine.

After presenting these recommendations, Dr. Harris moved that the communication from the Medical Society of the County of New York, relating to additions to the medical law, making certain professional misconduct a cause for the revocation of the license to practice medicine in this state be approved, and that it be referred to a special committee of five, of which the Committee on Legislation shall be members, others to be appointed by the President for the purpose of preparing a bill in accordance with the recommendations, which shall be introduced into the legislature of 1913, provided, however, such bill is approved by the Council of this Society.

Motion seconded.

After discussion by Dr. Harris and Mr. Lewis, attorney for the Society, it was moved to amend, that this matter with the recommendations be referred to the Committee on Legislation without instruction.

The amendment was seconded, accepted, and the original motion as amended was carried.

THE SECRETARY: The County of Richmond has asked to be placed in the First District Branch. It is now in the Second. This involves an amendment to Chapter VIII, Section I, of the By-Laws.

THE PRESIDENT: This amendment will lie over for a year.

Dr. Walter B. Chase presented the following resolutions:

Whereas, The American Medical Association, appreciating the need of the dissemination of knowledge relating to Preventive Medicine, did in 1910 appoint the "Public Health Education Committee of the American Medical Association;" and as

This work has been organized and carried into activity by a national central committee of female physicians, and sub-committees have been organized, until there are at this time forty-three State sub-committees, besides those in Panama, Alaska and the Philippine Islands; since which time more than 5,000 public lectures have been given under their auspices; and as

In the State of New York this work of the "Public Health Publication Committee" has been ably organized and carried forward successfully under the authority and fostering care of some County Medical Societies; particularly is this true in the Borough of Manhattan and the Borough of Brooklyn in New York City, though the work is not confined to this metropolitan center; and

In view of the fact that public sentiment is awakening to the necessity of extending such information in the State of New York, as seen in the coöperation the public is giving to the prevention of Tuberculosis and amelioration of its unfortunate victims;

It is Resolved, That the Medical Society of the State of New York approves the action of the American Medical Association, and pledges its aid and coöperation in furthering its work in this State;

It is further Resolved, That the Council be and hereby is delegated with full authority to make the preceding resolution operative, and that it promote along ethical lines, needed activity in disseminating the principles of preventive medicine.

THE PRESIDENT: These resolutions are before you. What disposition do you wish to make of them?

DR. ROSALIE S. MORTON: I move that the resolutions be adopted.

Motion seconded.

After discussion by Doctors Chase, Le Fevre, and Mabbott, Dr. Van Cott moved as a substitute for the last two paragraphs, the following:

"Resolved, That the Medical Society of the State of New York approves the action of the American Medical Association."

Original motion with substitute seconded and carried.

DR. F. H. MCKEE: At the regular meeting of the Eighth District Branch, held at Dunkirk, September 18, 1911, it was resolved that the Medical Society of the State of New York be requested to refer to its appropriate committee for consideration the desirability of securing such amendments to the State Licensing Act as will prevent the graduation of medical students under the age of twenty-five.

Dr. McKee moved that this matter be referred to Dr. Hick's committee.

Motion seconded, but on being put to vote was declared lost.

DR. LE FEVRE: The Committee on Experimental Medicine desires to hand in the following resolutions:

Whereas, Frequently indeed strenuous efforts are made by ignorant and misguided, and by unprincipled persons to needlessly interfere with, and to disrupt and destroy by fallacious exhibits and ridiculously false private and public utterances, animal experimentation for the prevention and cure of disease; and

Whereas, Bills directed to the securing of one or all of these purposes are annually introduced for legislative approval and authorization; therefore, be it

Resolved, That the Committee on Experimental Medicine be and is hereby reconstituted; and be it further

Resolved, That said Committee be and is hereby directed to instruct the laity and the public in the benefits and the rewards of animal experimentation related to the prevention and cure of disease and the saving of human life.

Also, the Committee is directed to resist by all honorable means, at all times, contemplated legislation directed to opposing or hindering lawful animal experimentation practiced for the purpose above mentioned.

Resolved, That our gratitude to the Honorable, the members of the legislature of this State, for their wise and truly humane course in preventing the enactment of laws interfering with legal animal experimentation, is thankfully expressed, and their actions are profoundly appreciated.

Resolved, That the reconstituted committee be composed of the following-named members of the Society: Hermann M. Biggs, New York; Algernon Thomas Bristow, Brooklyn; Joseph Decatur Bryant, New York;

Frederic Russell Calkins, Watertown; William Francis Campbell, Brooklyn; William S. Cheesman, Auburn; T. Wood Clarke, Utica; B. Farquhar Curtis, Scarborough; Henry L. Elsner, Syracuse; James Ewing, New York; Edward D. Fisher, New York; Charles Burdett Forsyth, Alexandria Bay; Samuel E. Getty, Yonkers; Samuel Waldron Lambert, New York; Egbert Le Fevre, New York; Hersey Goodwin Locke, Syracuse; Grant C. Madill, Ogdensburg; Wesley T. Mulligan, Rochester; William Hallock Park, New York; William Mecklenburg Polk, New York; James E. Sadlier, Poughkeepsie; Henry Ernest Schmid, White Plains; William W. Skinner, Geneva; Charles G. Stockton, Buffalo; Charles Stover, Amsterdam; John S. Thacher, New York; W. Gilman Thompson, New York; Wisner R. Townsend, New York; Joshua M. Van Cott, Brooklyn; Albert Vander Veer, Albany; Frank Van Fleet, New York; Samuel Baldwin Ward, Albany; Grover W. Wende, Buffalo.

It was moved that the resolutions be adopted.

Motion seconded and carried.

Dr. Grant C. Madill offered the following:

Resolved, That it is the consensus of opinion of the members of the House of Delegates that the division of the Society into sections for the transaction of scientific business, as arranged by the President and Committee on Scientific Work for the present meeting, be continued in the future.

Motion seconded and carried.

Dr. Le Fevre presented the following resolution:

Whereas, The ever present urgency for a Department of Health at Washington, and the unseemly delay characterizing the efforts to obtain the same, are matters of profound regret to those who have concern for the security of business, and the comfort and safety of the people; and

Whereas, The chief magistrates of our country for nearly twenty years have favored the proposition; and also the American Medical Association, the Medical Society of the State of New York, and the medical societies of other states, likewise various learned bodies of patriotic and public spirit kind, have each favored and urged the measure; therefore, be it

Resolved, That we, the delegates of the Medical Society of the State of New York now in executive session do earnestly urge and strongly appeal to all good people in behalf of the establishment at Washington of a National Department of Health, and we do pledge our strongest efforts in the use of honorable means in securing the prompt enactment of a law providing for the same.

Motion seconded and carried.

Dr. Le Fevre likewise presented the following resolutions:

Whereas, An efficient and non-partisan quarantine service is of great importance to the industrial and sanitary safety of this and contiguous countries; and

Whereas, The sanitary vigilance and practical wisdom essential to the proper control of quarantine affairs, especially at the port of New York, demand initial enactment, comprehensive experience and more governmental support; therefore, be it

Resolved, That the essential features relating thereto are better conserved and more securely fixed by Federal than by State control; therefore, be it

Resolved, That we of the House of Delegates assembled in executive session do express our belief that the quarantine service of the State and of the country should be wholly in charge of the Federal government.

Motion seconded and carried.

Dr. William H. Thornton moved, as there was no other new business to come before the meeting, that the House of Delegates do now adjourn until 9 A. M., Tuesday, and that the first order of business shall be the election of officers.

Motion seconded and carried.

Whereupon the house then adjourned.

ADJOURNED MEETING OF THE HOUSE OF DELEGATES.

The adjourned meeting of the House of Delegates was called to order at 9.10 A. M., Tuesday, April 16, 1912, Dr. Wendell C. Phillips, President, in the chair. Dr. Wisner R. Townsend, Secretary.

The nomination and election of officers being in order, Dr. Altman moved that nominating speeches be limited to two minutes.

Motion seconded and carried.

The following officers were nominated and duly elected:

President, Dr. John F. Whitbeck, Rochester; First Vice-President, Dr. W. S. Gleason, Newburgh; Second Vice-President, Dr. W. F. Campbell, Brooklyn; Third Vice-President, Dr. R. Paul Higgins, Cortland; Secretary, Dr. Wisner R. Townsend, New York City; Treasurer, Dr. Alexander Lambert, New York City.

The President appointed Drs. E. Eliot Harris, S. W. S. Toms, and Dwight H. Murray as tellers to count the vote for delegates to the American Medical Association. The following were placed in nomination:

Drs. Wendell C. Phillips, N. Y. City; Dwight H. Murray, Syracuse; James P. Warbasse, Brooklyn; Leo H. Neuman, Albany; Julius Ullman, Buffalo; Walter L. Carr, N. Y. City; Owen E. Jones, Rochester; Grant C. Madill, Ogdensburg; Rosalie Slaughter Morton, N. Y. City; William D. Johnson, Batavia.

The tellers reported that 101 votes were cast, 97 of which were perfect, 4 defective.

The following received a majority of the votes cast: Drs. Wendell C. Phillips, 88; W. D. Johnson, 62; J. P. Warbasse, 57; D. H. Murray, 50.

Upon motion duly seconded and carried they were declared elected as Delegates.

Dr. G. C. Madill received 47; Drs. L. H. Neuman, 39; J. Ullman, 39; R. S. Morton, 36; O. E. Jones, 31; W. L. Carr, 31.

Upon motion duly seconded and carried Dr. Madill was declared elected fifth delegate.

Upon motion duly seconded and carried Drs. Neuman, Ullman, Morton, Jones and Carr were declared elected Alternate Delegates.

Chairman of Committee on Scientific Work: Dr. Thomas J. Harris, New York City.

Chairman of Committee on Legislation: Dr. R. P. Bush, Horseheads.

Chairman of Committee on Public Health: Dr. J. M. Van Cott, Brooklyn.

Chairman of Committee on Arrangements: Dr. Wesley T. Mulligan, Rochester.

Dr. Le Fevre, Chairman of the Committee on President's and other Reports, presented the following report:

PRESIDENT'S REPORT.

1. That a special committee be appointed to revise the By-Laws and report at the meeting of 1913.
2. That the Council be authorized to designate the sections and the necessary officers thereof for the next annual meeting.
3. That all matters referring to the Public Health Law be referred to the Committee on Public Health to report at the next annual meeting.
4. That the House of Delegates earnestly recommends to the County Societies that it is essential for the dignity of the profession and welfare of the public that every possible effort be made to enforce the section of the Principles of Ethics of the American Medical Association that relates to the giving or receiving of commissions for recommending patients requiring general or special treatment or surgical operations. The Medical Society of the State of New York will heartily cooperate in any way possible with the County Societies in the enforcement of these Principles of Ethics.
5. That in relation to the "Care of Aged and Dependent Members." that a committee of five members of the Medical Society of the State of New York be ap-

pointed to confer with the committees of other organizations formed for the same purpose.

SECRETARY'S REPORT.

6. That the recommendations in the report of the Secretary be referred to the Committee on Revision of the By-Laws.

EXPERT TESTIMONY REPORT.

7. That the supplementary report of the Committee on Expert Testimony be referred back to the Committee with the recommendation that the Committee confer with the Committee on Expert Testimony of the Bar Association so that the recommendations may meet both the legal and the medical requirements.

It is recommended that the Committee be continued and constituted as noted in the supplementary report.

On motion, the report was received.

Each section of the report was then taken up *seriatim* and adopted, after which, on motion, the report was adopted as a whole.

Dr. Ward again presented the resolution referring to the appeal from the decision of the Medical Society of the County of Oneida by J. Orley Stranahan, John E. Groff, William B. Reid and George C. Reid. Motion seconded by Dr. F. T. Douglas, adopted unanimously.

At this juncture, the President declared a recess of five minutes in order to organize the general meeting of the Society.

A recess of five minutes having been taken, the House of Delegates reconvened.

THE PRESIDENT: If you will permit the President a word or two at this time, he desires to compliment the Medical Society of the State of New York on the County Societies having selected a body of delegates of such high character, intelligence and activity. It certainly has been a great pleasure to preside over this body.

DR. GILLETTE: As we have been complimented by the President, I wish to move a vote of thanks to President Phillips for the interest and energy that he has displayed during the past year on behalf of the medical profession of the State of New York.

The motion seconded by several delegates, was put by the Secretary, and unanimously carried.

The President said he greatly appreciated the vote of thanks.

As there was no further business to come before the meeting, on motion, the House of Delegates then adjourned *sine die*.

WISNER R. TOWNSEND,
Secretary.

MEETING OF THE COUNCIL.

A regular meeting of the Council of the Medical Society of the State of New York was held in the City Hall, Albany, April 18, 1912, at 2 P. M. Dr. John F. W. Whitbeck, president, in the chair. Dr. Wisner R. Townsend, secretary.

The meeting was called to order by the President and on roll call the following answered to their names:

John F. W. Whitbeck, Walter B. Chase, Henry A. Eastman, Fred G. Fielding, W. Stanton Gleason, Alexander Lambert, Frederick M. Miller, Wesley T. Mulligan, Herbert B. Smith, James K. Stockwell, Wisner R. Townsend, and Joshua M. Van Cott. Telegrams were read from Drs. Higgins and Hardenbergh explaining their absence.

Moved, seconded and carried that the minutes of the last meeting be adopted as printed in the January, 1912, issue of the NEW YORK STATE JOURNAL OF MEDICINE.

Moved, seconded and carried that the Secretary of the State Society be requested to attend the meeting of the Association of State Secretaries and Editors, to be held in Atlantic City, June 3, and that upon presentation of proper vouchers he may have his expenses paid.

Moved, seconded and carried that the following Committee on Publication be appointed, and that it be authorized to appoint an editor on the same terms as last year and to publish the Journal and Directory for the ensuing year:

S. W. S. Toms, chairman; Floyd M. Crandall, S. E. Getty, Alexander Lambert, and H. G. Webster.

Moved, seconded and carried that Mr. James Taylor Lewis be appointed counsel on the same terms as last year.

Moved, seconded and carried that Mr. Alfred H. Wicks be appointed auditor on the same terms as last year.

Moved, seconded and carried that officers, members of committees and delegates of the Medical Society of the State of New York upon presentation of proper vouchers may have their railroad fares paid when traveling on business of the Society.

Moved, seconded and carried, that a committee of three be appointed, of which the Secretary of the Society shall be the chairman, to pass on such amendments or alterations as may be submitted by the County Societies to their Constitutions and By-Laws.

Moved, seconded and carried that a Committee on Finance be appointed to consist of three members and that the duties of this Committee be to authorize such expenditures as they consider advisable, and that the officers, chairmen and members of committees incur no expense on behalf of the Society, except railroad fares, without the approval of said committee.

Moved, seconded and carried that on and after July 1, 1912, no member of the Medical Society of the State of New York shall receive the Directory, the NEW YORK STATE JOURNAL OF MEDICINE, nor be entitled to malpractice defense until his county dues and state assessments have been paid.

Moved, seconded and carried that in order to encourage increase in membership for the year 1912, all members who are elected between October 1, 1912, and December 31, 1912, and who shall pay during that period their state assessment may have the same credited to 1913, provided that they request it. All whose assessments are so credited shall be entitled to malpractice defense for 1912, but shall not be entitled to receive the Directory or the JOURNAL for 1912. State assessments so credited shall be immediately forwarded by the County Treasurers to the State Treasurer.

Moved, seconded and carried that the chairmen of standing committees present for appointment the members of their committees at the May meeting of the Council.

The chair appointed the following Committee on Finance:

Drs. William F. Campbell, Alexander Lambert, and William S. Gleason.

The chair appointed the following Committee on County Society By-Laws:

Drs. Walter B. Chase, Thomas J. Harris, and Wisner R. Townsend.

There being no further business the meeting adjourned to meet May 3rd, at 2.30 P. M., in office of Society, Room 37, New York Academy of Medicine, 17 West 43rd Street, New York City.

WISNER R. TOWNSEND, *Secretary.*

SECTIONS AND SECTIONS OFFICERS FOR ANNUAL MEETING, 1913.

At a meeting of the Council held at the rooms of the Society, 17 West 43d Street, on May 3, 1912, it was

RESOLVED, That the Scientific Session of the next Annual Meeting be divided into the following Sections:

Medicine; Surgery; Eye, Ear, Nose and

Throat; Pediatrics; Obstetrics and Gynecology.

The officers elected were:

SECTION ON MEDICINE.

DeLancey Rochester, Chairman, Buffalo.
Norman K. MacLeod, Secretary, Buffalo.

SECTION ON SURGERY.

Martin B. Tinker, Chairman, Ithaca.
Willis E. Bowen, Secretary, Rochester.

SECTION ON EYE, EAR, NOSE AND THROAT.

John E. Weeks, Chairman, N. Y. City.
Thomas H. Halsted, Secretary, Syracuse.

SECTION ON PEDIATRICS.

Henry L. K. Shaw, Chairman, Albany.
Thomas S. Southworth, Secretary, N. Y. City.

SECTION ON OBSTETRICS AND GYNECOLOGY.

William M. Brown, Chairman, Rochester.
Ross McPherson, Secretary, N. Y. City.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

W. B. Saunders Company Illustrated Catalogue (16th) edition, which describes some forty new books and new editions published by them since the issuance of the former edition.

The books listed in this catalogue cover every subject of interest to the medical man. The descriptions and illustrations are such as to enable the reader to select easily just the book he wishes on any branch. It is really an index to correct medical literature—an index by which the practitioner, the surgeon, and the specialist can acquaint himself with what is new in the literature of his subject.

This edition also contains an illustration and description of Saunders' new building, now being erected on Washington Square, Philadelphia's new publishing center.

Any physician wishing a copy of this handsome catalogue can obtain one free by addressing W. B. Saunders Company, 925 Walnut Street, Philadelphia.

DEATHS.

FRANCIS W. BOWRON, M.D., Brooklyn, died April 11, 1912.

HAROLD F. JEWETT, M.D., Brooklyn, died April 12, 1912.

CHARLES W. NICHOLS, M.D., Whitesboro, died April 23, 1912.

VICTOR SEYMOUR PIER, M.D., Brooklyn, died April 17, 1912.

HERBERT C. ROGERS, M.D., Brooklyn, died April 29, 1912.

S. OAKLEY VANDER POEL, M.D., New York City, died April 22, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

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ALGERNON THOMAS BRISTOW, M.D., Editor

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Henry G. Webster, M.D., Brooklyn

Vol. XII.

JUNE, 1912

No. 6

EDITORIAL DEPARTMENT

THE DOCTOR'S BILL.

IN this day of economic medicine, the practitioner who neglects the business side of his work lowers the dignity of his calling in the public eye. The man of independent means may play the philanthropist, but in so doing he adds to the burdens and temptations of his less fortunate brother whose practice must support a family. There is nothing so despicable as a well-to-do doctor rendering gratuitous service to the pay-as-you-please class. Some of the so-called leaders in the profession may be found the worst offenders against the spirit of the principles of ethics in this matter of cutting fees.

For attending a case of pneumonia, typhoid, appendicitis, childbirth, or plain imagination, a physician is entitled to reasonable compensation, depending, first, on his personal valuation of his own services, secondly, on the time devoted to the effort, and finally, on the prevailing standard of fees in the community. The patient's prominence or wealth has little or nothing to do with the amount of the fee justly charged; it should not affect the doctor's fee any more than it should affect the price of an automobile or a pair of shoes. A doctor must be either a business man or a beggar.

It is unwise and unnecessary to itemize the bill further than stating the date and nature of the service rendered. Were doctors' bills

never itemized, the public would not be continually howling about our charges. A lawyer spends half the time a doctor does learning his business, yet he commands a fee beside which the doctor's looks pigmy; and the reason he collects that fee is that he charges for the case rather than for each individual consultation or interview.

A fee bill is an instrument which should be retained in our own hands as a guide in fixing charges; it should never, under any circumstances, be made public. Publication of itemized fee bills is precisely upon a par with a butcher's tariff for various cuts of meat; medical societies forget the dignity of their function when they offer fee-bills to the public press. What purpose is served by making the matter public? Just this: the bargain hunting share of the public concludes that the "doctors' trust" is trying to rob the people, and there is a scramble for the cheap man. Does the fee bill force the cheap man to charge a reasonable fee? Not at all; it boosts his business interests among the very class he caters to. A fee bill, if it is to serve any good purpose, should be held sacredly confidential among ourselves.

If a practitioner, for any reason whatsoever, sees fit to reduce his fees below the minimum, for one or for all of his patients, that is his own personal business, and nobody has any right

to interfere. There is no medical trust, no medical union, no boycott. Time will teach him the lesson he needs without our concern. He will learn one day that the public, after all, gauges a man's ability by his self esteem. Look about you in your own community and see whether this is not true. The good men command the best fees; and one reason they are good men is because they have *demand*ed the best fees. Idemque the cheap men.

Of course every practitioner to-day makes a record of each visit or treatment at the time it occurs, but this is for clinical purposes, and should be separate from the memorandum of account, for obvious business and legal reasons. The physician who cannot obtain a settlement of his accounts without resorting to the antediluvian itemized bill should begin to educate his clientele to better ways. The patient who can trust you to administer poisonous drugs or use the knife, should certainly trust you to render an honest bill.

Our forefathers in the healing art, being great guessers, were afflicted with a false modesty which made them ashamed to take the money; and furthermore, their competition was inconsiderable as compared with that of to-day—I mean their extra-professional competition. Our work is at least two-thirds scientifically accurate and only in small part guess-work. Therefore, why are we ashamed to take the money?

We are ashamed. We want our patients to know that we are conscience-stricken in collecting fees; we confess a lack of self esteem daily. We "throw off" a certain percentage of a reasonable and just account, from motives of shame or guilt or greed—in order to effect a settlement. How many business firms practice such a ruinous policy? Some of the public utility companies do, it is true, but why? To catch the irresponsible customer; and the little ten per cent. rebate is always added to the charge in advance, you may be sure. We never see a merchant—other than the old style Jew clothier—offering 20 and 50 per cent. reductions on accounts *past due*. No, indeed, that is a rite sacred to our profession—a hereditary rite handed down by those guessing medical ancestors who were by contrast properly and reasonably ashamed to take the money. It is high time we should rise to the position of any honest laborer worthy of his hire. Whatever amount we charge in the bill, be it great or small, we should hold to that amount just as though we had loaned the money.

A doctor's bill no longer needs an excuse tacked on the top. Nobody worth while feels insulted when the doctor asks for his pay. It looks more business-like, and it certainly makes for better business results, to omit that apologetic phrase so many have printed at the head of their statement—"Monthly Statement," or "Quarterly Statement," as the case may be. Some timid souls, in their excess of modesty, go even fur-

ther in this abject confession of weakness: "Monthly Statement," runs the apology, "Bills rendered monthly. This is *not* a demand for settlement." For Heaven's sake, then what is it?—a letter of condolence? If a creditor doesn't expect settlement, why shouldn't the debtor thrust the bill aside until more pressing matters like butchers' and grocers' bills are met? My printer's statements bear this legend: "All bills due and *must* be settled within ten days from date."—and my printer is a great success in his business. It's bad business to pay a bill before it is due; the debtor might better place the money in bank at interest—or buy a phonograph.

Let us not forget what we are charging for. The words *Professional Services* do not signify cure or even improvement, but merely the best aid the doctor can render under the conditions surrounding the patient. The fee, no matter how large, despite certain philanthropic colleagues, is never exorbitant, provided the doctor has put forth an earnest effort in behalf of his patient. A life or a limb, or health itself, has no price that can be expressed in figures. Whenever you find yourself thinking that any fee you may have collected was "easy money," forget it quick! With that delusion in your head, your income is bound to diminish. The healthy way to look upon one's business position is this: *I am not half paid for all the good I do*. Could every doctor repeat these words with sincerity, the contract evil would shortly die of inanition. Such a feeling cannot help but make a man a greater success in his profession.

It is an excellent tonic to have occasional bargain hunters desert you to search for a cheaper man. It stimulates your self esteem, and it increases the deserters' respect for you. They often come back. The force of psychology brings them back; they reason that a man who demands a given fee must be worth it. Every practitioner of medicine must set his own price and make his own reputation. To drift along with the ill advised intention of weeding out some day is a very doubtful policy to pursue; weeds grow faster than good plants, and choke off the good plants in time. The thrifty gardener keeps the weeds down from the beginning. Better to content yourself with a \$3,000 practise, eighty per cent collectible, than to struggle with a \$5,000 practise, only fifty per cent. good.

In small villages where the regular profession fixes on a dollar or a dollar and a half for visits, and fifty cents or a dollar for office consultations, the business-like osteopath steps in and demands three dollars for visits and two dollars for office treatments. The public pays the difference for psychic reasons—and the same motive has much to do with the increasing popularity of all the healing fads. It is time the regular profession should lift up its head and help itself.

WILLIAM BRADY, M.D.

Original Articles

THE PREVENTION OF BLINDNESS AND THE INSTRUCTION OF THE BLIND CHILD.*

By G. E. de SCHWEINITZ, M.D.,

PHILADELPHIA, PA.

THE title of the subject assigned for this evening's discussion is so comprehensive that it is impossible to do more than touch, and that very superficially on one or two phases of it. In general terms blindness is ocular in the sense that the eye itself is the seat of the lesion which destroys the sight, or central in the sense that the lesion is situated in some portion of the brain which is concerned with the conduction and with the registration of visual impressions, the causes concerned with impairment and with destruction of vision being either congenital or acquired. With the congenital blindness I shall have little concern except in incidental mention; of acquired blindness I am able to refer only to a few conspicuous types, the management of which has been the object of much study and attention on the part of physicians, publicists and teachers of the blind. Of the various diseases responsible for acquired blindness there is one which takes prominent position, to wit,

Ophthalmia Neonatorum, a form of inflammation of the conjunctiva, which, as you know, usually begins on the third day after birth, and which in sixty to seventy per cent. of properly examined cases is due to an infection of the conjunctiva caused by a special micro-organism, the gonococcus of Neisser, the infecting material gaining entrance into the conjunctival sac during the birth of the child.

While there are no complete statistics showing the prevalence of ophthalmia neonatorum, an approximate idea can be obtained by studying the admissions to schools for the blind,¹ and in any list of carefully tabulated causes of blindness this disease far exceeds in potency any of the other etiological factors. Permit a few examples, and I confine myself not merely to general statements, but to careful statistical information. Thus, N. Bishop Harman,² writing in 1907, showed that among the scholars of the schools for the blind established by the School Board for London, the percentage of blindness arising from ophthalmia neonatorum was 36.36. while if all those who in later years would pass as badsighted and not blind were eliminated, the percentage of blindness from this disease alone would exceed 40. This closely corresponds with statistical information gathered by many writers on this subject in various continental countries,

where it will be found that this percentage varies from 34 to 46, and even in the most favorable tabular statements, favorable in the sense that the frequency of this disease in causing blindness has diminished, the percentage is not less than 25 or 26. To put this matter in another form, I may say that Mr. Harman, writing in 1907, has pointed out that among every 100 children born in the City of London one child suffered from purulent inflammation of the eyes in the first few days of life, and of every 2,000 children born, one is blinded, or partially blinded, by this disease. Is it small wonder, then, that writing nearly a quarter of a century ago, Rivière exclaims that "purulent ophthalmia of this type alone is responsible for nearly one-third of the cases of blindness, and has placed in the care of Europe well-nigh 100,000 victims," and in the same period of time, as Lucien Howe and other notable and noble workers in our own country have shown, fully 32 per cent. of the blind owe their affliction to this disease. Now the humiliating thing is this, that at the present time the matter has not greatly improved. Thus, in the United States and Canada in 1907 in ten schools for the blind, 24.38 per cent. of those admitted had lost their sight from this cause, and in 1910 out of 351 admissions to certain schools in the same countries, the percentage was 23.9.³ In our own country there are at least 100,000 blind persons, and the eyesight of 40,000 of these 100,000 unfortunate ones, under proper precautions and with suitable treatment, could have been saved, or at least partially saved, in the sense that practical or total blindness could have been prevented. Referring particularly to ophthalmia neonatorum, it may be said that from one-tenth to one-eighth of all of the blindness in this country is due to this cause, and that therefore of these 100,000 blind persons, 10,000 of them are blind from this disease, and in the largest number of instances this blindness could have been prevented.⁴

It is therefore altogether fitting and proper that this subject should come into discussion at the meeting of the Medical Society of the great State of New York, if for no other reason than this, that just in this State the first real movement of reform in the methods of preventing blindness from this cause was started. For more than a quarter of a century one of your distinguished citizens and fellow members, with quiet persistence, with conscientious effort, and with, I am happy to say, in many instances distinguished success, has wakened the conscience of the people and stimulated the efforts of the physicians and legislators to wipe this disgrace from our land. I need not tell you that I refer to Dr. Lucien Howe of Buffalo.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

¹ Consult Public Health Bulletin, No. 49, 1911, on Ophthalmia Neonatorum, by J. W. Kerr.

² Preventable Blindness, New York, William Wood & Co., 1907.

³ Consult J. W. Kerr, Health Bulletin 49, 1911.

⁴ Consult also Prevention of Infantile Blindness, by C. F. F. Campbell, Annals Amer. Acad. Polit. and Social Science, March, 1911.

Time does not permit a discussion of the splendid efforts that are being made by various Societies in Massachusetts, Maryland, Ohio and other States, and in New York under the auspices of the Russell Sage Foundation, nor of the work of the Committees of the American Ophthalmological Society, the first, indeed, which were active in this interest, of that of the American Medical Association, and of the newly established Association for the Conservation of Vision, and especially of the efforts of another one of your members and citizens, who has so conspicuously distinguished himself in this public-spirited task, Dr. F. Park Lewis of Buffalo.

To save human beings from the affliction of blindness is work of the noblest, and that alone should be sufficient inspiration for any amount of concerted effort, but if there is any one who wishes to discuss the matter from the economic standpoint alone, he can easily be satisfied. Dr. I. W. Voorhees⁵ writes thus: "When it is once thoroughly realized by business organizations and by commercial interests that the present waste of life means an enormous loss, not only to the country at large, but also to the business interests themselves, steps will be taken to prevent the waste of life and energy which has been going on for so long a time unchecked." "Professor Fisher says," he continues, "that \$1,500,000,000 annually is the very lowest at which we can estimate the preventable loss from disease and death in this country." These are staggering figures. Exactly what share of this enormous economic loss belongs to blindness it would be difficult to compute. But here are some data. As Mr. Campbell points out, the cost to the State of maintaining a blind person throughout the duration of his life, owing to imperfect information is hard to calculate, but it approximates roughly \$10,000. He further shows that for the education and maintenance of the victims of ophthalmia neonatorum attending state schools for the blind in Massachusetts, New York, Ohio and Pennsylvania, the annual expenditure of public funds in excess of the cost of educating the same number of seeing children in public schools, approximately is \$110,000, and if all figures were available, the total annual excess cost in these four states alone for the education and maintenance of children blind from this, nearly without exception, preventable cause, would not fall short of \$150,000. Let me put this more directly for one state alone.⁶ In Massachusetts at least 100 of the young blind have lost their sight from ophthalmia neonatorum. These 100 young per-

sons will eventually cost the state \$300,000 for education alone, while the economic loss to the Commonwealth, because of their life-long dependence, will be many times that sum. Now if this is true of four states in this great Union, and of one state where the cost of blindness has been carefully calculated, what do you suppose the bill must be when the entire country sends its account? Why, then, should any one stay his hand, or lessen his endeavor in this most important public work?

Many schemes for the elimination of this preventable disease have been brought forward: Education, compulsory notification, the punishment by law of offenders against properly constructed legal regulations, and compulsory prophylaxis.

(a) *Concerning Education on this Matter.* This necessarily most intimately concerns the midwife, nurse, or other person having charge of a new-born child, but it should not end here. While the dangers of ophthalmia neonatorum are necessarily dwelt upon by those teachers in schools of medicine whose work is concerned with diseases of the eye, medical students should receive similar instruction from the chairs of obstetrics, bacteriology, sanitary science and hygiene. If these lessons are thus early instilled, these students becoming general practitioners of medicine will have a better sense of their responsibility when they go out to their life's work than, I regret to say, is possessed by some physicians at the present time. With this knowledge, and with this respect for responsibility, these doctors will readily join in a united effort to secure the passage by our legislative assemblies of needed laws which may be enforced by local boards of health.

The qualifications necessary for the registration of midwives in this and other countries should more often and more satisfactorily include proficiency of knowledge on this subject. The recommendation of the capable Committee on Ophthalmia Neonatorum of the American Medical Association that there shall be a distribution by boards of health of circulars of advice to midwives and mothers, giving instructions as to the dangers, method of infection and prophylaxis of ophthalmia neonatorum is to be commended, but I am satisfied that quite as much to the point is a more intimate education on this subject of mothers of families, especially in poor and crowded districts. There is a widespread belief that the disease occurs most largely among the very poor emigrant, non-English-speaking class. Boston statistics indicate that this is not always the case, for among 116 cases of ophthalmia neonatorum treated in the Gardner Ward of the Massachusetts Charitable Eye and Ear Infirmary it was found that 73 had come from English-speaking parentage and 63 from homes that were considered to be good. Still, in some work in which I have been interested, un-

⁵ The Prolongation of Life, *The Independent*, February 26, 1912.

⁶ Report of the Massachusetts Commission for the Blind, June, 1909. Assistant Surgeon General Kerr points out that in 1910 Massachusetts appropriated \$40,000 for the support of its blind asylums, the State of New York, \$110,000; while the biennial appropriation for Pennsylvania for its institutions of the same kind in 1909 amounted to \$265,000. If to these figures are added private expenses, amounts spent by states and cities, and an estimate of the potential earning power of individuals thus disabled, the economic loss on account of ophthalmia neonatorum is enormous.

dertaken through the Health Committee of the Philadelphia Civic Club, it has been found that if at stated meetings some one who is popular in the community, perhaps in the ward, if it be a great city, who is willing in simple language to instruct, not merely the poor but those who are in modest circumstances, and therefore whose homes are good, in the dangers of this matter, much good will result. It has been further found, especially when dealing with Hebrews, Italians, Russians, Poles and Hungarians, who are apt to herd together and are clannish in their instincts and habits, that if some one of their own number (for there is very apt to be a patriarch, a sort of a head man among them), is willing to undertake a lecture of this kind in the language spoken by the majority of the audience, which has previously been prepared for him, the mothers will listen far better than they will to the social worker herself or to any physician who somewhat perfunctorily addresses them and will surely learn more than from any distributed letter of instruction. Under these circumstances the mother herself becomes interested and is made to understand that she must demand as soon as her child is born to know whether proper prophylaxis prior to the birth, or prophylaxis as applied to the eyes of the child after the birth, has been used, and if it has not been used, to know why, and if the answers are still unsatisfactory, to insist upon proper attention and attendance.

(b) *Compulsory Prophylaxis and the Free Distribution of a Prophylactic.* Numerous statistics gathered by various writers on this subject, notably by Howe of our own country and Stephen Mayou in Great Britain, indicate that there has been a more or less distinct decrease in the number of cases of ophthalmia neonatorum since the introduction in 1881 of the Credé-prophylactic treatment. They naturally refer in largest measure to the satisfactory and scientific use of this remedy in large institutions where trained hands and trained service are available. Whether it is wise to send out freely ampules containing even a weak solution of nitrate of silver (for this is the prophylactic which a collective investigation made by the Committee of the American Medical Association indicates as the one which has proved of the greatest service), is hardly a question for discussion this evening. Without doubt in institutions where it has been possible to remove the danger of infection prior to birth, Credé's method, or one of its modifications, is the proper procedure, but I question whether it is the proper remedy to place in the hands of improperly instructed persons. On this point I quote again from Mr. Harman: "The local establishment of a prophylactic would at once dispel any ignorance as to the nature of the contagion intended to be combated, and the vast majority would strenuously resist the passing of

a measure intended for the safety of a few to the branding of all. It probably would result in making the measure inoperative, and not only so, there would be danger of making the measure inoperative in just those great institutions where its present use has accomplished the most remarkable results." On the other hand, Mr. Mayou considers this to be an entirely false objection to this treatment, and believes that it is responsible for the majority of cases of the disease which still exist in his country. He disputes that this compulsory prophylaxis would cast a slur on the character of the parents of the children, because only about 65 per cent. of the cases are due to the gonococcus, and as infection may take place after the birth of the child, this seems to him sufficient to do away with the objection, taking into account the serious nature of the disease. I have endeavored to find out, with the aid of the Secretary of the Committee on the Prevention of Blindness of the New York Association for the Blind whether any advantage or disadvantage has been derived from the compulsory distribution of a prophylactic against ophthalmia neonatorum. Four states have secured appropriations ranging from \$2,500 to \$5,000 for this purpose, and two others are endeavoring to do the same thing. In a sense, however, a distribution is not compulsory because the prophylactic tubes are distributed through local health officers to physicians and midwives who apply for them. The files of this office have at the present time no statistics to offer as to advantage or disadvantage under these circumstances, except that they show that the Commissioner of the New York State Department of Health has renewed his request for an appropriation for this purpose for three successive years. It would seem that this is a question which must be ultimately settled, as the Committee of the American Medical Association points out, by a consultation between the committees of experienced physicians which exist in each state and the Department of State Public Health. Just because, as Surgeon-General Kerr aptly says, the activities of the sanitarian are too often confined to pointing out the evils of the disease which he has no means at his disposal to combat, we must turn to society as a whole, "which must utilize the knowledge at its disposal and furnish the means to eliminate the disease." Therefore the dissemination of this knowledge through the channels which I have described becomes an important part of our effort to wipe this disgrace from civilized lands.

(c) *Concerning Compulsory Notification.* According to Assistant Surgeon-General Kerr,⁷ the first legal steps taken by any state to control ophthalmia neonatorum in the United States were those of Maine in 1891. One year later New York followed with an amendment to the law relative to midwives and nurses. Up to April 12, 1911, twenty-five states and the District of

⁷Loc. cit. Public Health Bulletin, No. 49.

Columbia have taken legislative action. The Sanitary Code of Louisiana also contains provisions with respect to ophthalmia neonatorum. The provisions of the several laws vary and time does not permit a description of these variations.⁸ In general terms the provisions of the "Howe law," as it is often called, are followed, which requires that inflammation and swelling of infants' eyes shall be reported by nurses, midwives or other persons in attendance. In one or two other states physicians are also required to give notice of cases of ophthalmia neonatorum. Unfortunately, the provision of the law are not always actively operative in many of these states. Indeed, on the report of the Committee on Prevention of Blindness of the New York Association for the Blind the law is inoperative in all States except Massachusetts and Ohio.⁹

Now let us see what happens where it is operative. In 1910 the Massachusetts State Board of Health sent to each physician four separate notices of this reporting law. Such notices apparently proving insufficient, the Boston Board of Health instigated a test prosecution. An ophthalmia case was chosen which was not of the most virulent character and the child did not become blind, and yet the court convicted the physician for failing to report, and the Superior Court sustained the decision. One month prior to this conviction the number of returns under the law had been ten; a month afterward the number was 20. As there were no prosecutions during the succeeding month, the number of reports fell back to 10. Again there were prosecutions successfully carried through, and the returns rose during the next four months to 15, 32, 97 and 116 respectively. The Society for Promoting the Interests of the Blind in Cleveland¹⁰ secured a warrant for the arrest of a midwife who had failed to report the affection, and this was immediately followed by the report in less than two weeks of 8 cases of ophthalmia neonatorum, in every one of which the eyes were saved. The object of all of the laws to which reference has been made is to insure promptness in the early treatment of ophthalmia neonatorum, hence to the home of a poor man a competent nurse can be dispatched, who shall properly take care of the treatment and see that it is carried out. I could give many instances, if I chose, in the Social Service of the University Hospital in Philadelphia, where our workers on the first intimation of the presence of ophthalmia neonatorum in a family have promptly secured proper attention for the child, in the home, or if this was impossible, transferred the child to one of the wards where suitable treatment can be applied. So successful has this system been in Boston that since it has been instituted, and it is known there as the "follow-up system," not a

single known case of the disease has resulted in blindness.

Now while all of the present laws contain some good provisions, *e. g.*, registration of births, instruction on ophthalmia neonatorum, reporting of cases by midwives, parents, nurses and physicians to health authorities, control of midwives, free medical attendance, etc., a uniform law containing all such provisions should be enacted if we are successfully to control the ravages of ophthalmia neonatorum. Even as it is, taking it all in all, there is much truth in what Lucien Howe has said, that the law compelling nurses of all kinds, midwives, etc., to report these cases of ophthalmia neonatorum practically at once to some legally qualified practitioner, or to some responsible board, represents the most effective method at our command. This secures, as I have just shown, promptness in treatment, and evidently, again to quote Howe, when the strong hand of the law reaches out to a person, no matter who he or she may be, who trifles with the vision of an infant, the effect is extremely salutary.

In the majority of the states the laws do not require, as they do in France, that ophthalmia neonatorum shall be reported in the same manner as any other communicable disease. One of the objections that is constantly urged against the inclusion of this affection is the list of communicable diseases is that such reporting would be resented by the community at large, and particularly resented by the family from which the report was made. It must be remembered, however, that a large percentage of cases of ophthalmia neonatorum are not due to Neisser infection, and when this is more generally understood a report of this character is in largest measure robbed of its stigma. As Mr. Harman well puts it, "notification offends the scruples of no one, not even of those affected by the notification, if it be done decently. Besides, it would be welcomed by the general sense of self-preservation, for the disease is contagious and dangerous."

Trachoma. This disease, which first attracted notable attention toward the close of the 18th and the beginning of the 19th century on account of its dissemination through Europe by soldiers returning from Napoleon's Egyptian campaign is an affection that has a far more ancient lineage than this period. It is described in the Ebers papyrus, the oldest medical book on record, written during the height of Egyptian civilization in the 18th dynasty, 1553 B. C., and therefore more than a thousand years before Hippocrates flourished, and from time immemorial it has been endemic in Europe. Its name is derived from a Greek word meaning "rough" or "roughness," because it is an affection of the lining membrane of the eyelids, whereby numerous small bodies known as trachoma bodies, or follicles, are developed, which change the normal smooth surface of this membrane into a rough granular

⁸ For information on this point consult Public Health Bulletin No. 49.

⁹ Personal communication.

¹⁰ Fourth Annual Report, 1909-10.

condition, hence the common name "granular lids." Sometimes appearing in acute manifestation, it is usually characterized by chronicity from its incipency and always in its duration, as it may last for months and years and decades. Unchecked or untreated, it is liable to affect the clear tissue which caps the front of the eye, the corneal window through which the rays of light must pass to give us sight, causing it to lose its transparency or pass into actual ulceration. From this occurs great depreciation of vision, and in a certain percentage of cases blindness. As a cause of total blindness the percentage has varied in different statistical inquiries from 1.7 to 9.1 per cent., figures which fail utterly to give an adequate idea of the ravages of this disease in so far as useful sight is concerned, as the affection in some regions and lands has by its vitiation of vision disabled villages and districts. Much labor has been expended in the search for the exact nature of the contagious element, and time does not permit an analysis of these investigations, but out of all the confusion and contradictory observations which have been made in connection with trachoma, the contagious character of the affection in some of its stages and phases stands today clear and undoubted. From our present knowledge it must be admitted that trachoma extends more or less over the entire world, and in this sense is a universal disease. Fostered by ignorance, poverty and social misery, trachoma is essentially a disease among the poor, among whom it slowly gains ground. Although its subjects are often pale and anemic because of imperfect hygienic surroundings, there is no known constitutional disorder which produces the disease, and it may attack those who are in perfect health and does not respect those, other things being equal, whose lines are not cast in the quarters of poverty. A certain racial predisposition to trachoma has been maintained, the Mongolian race being especially liable to the disease, but throughout Asia trachoma is known to be no respecter of race, the Aryan, Semitic and Mongolian suffering with equal and terrible frequency. It is exceedingly common among the poorer classes in Ireland and Eastern Europe, especially in Poland, Russia, Hungary and certain districts in Prussia. Jews of the lower social order are most prone to be affected, and it is frequent among Italians of the lower classes, especially those who dwell in the south of Italy. For years it has been endemic in Egypt and equally endemic in Syria, Persia, Central Asia, China and Japan. The Indians of our own country are frequently attacked, and in certain regions of the United States native Americans are frequently infested with the disease, notably in some parts of Illinois, Kentucky and West Virginia. In short, it may under favorable conditions, exist and spread in any part of the world into which it is introduced.

This disease offers a serious menace in our own

country and gives the greatest concern to national, state and municipal authorities. Since 1897 our national government has maintained a strict inspection by which we are in a measure guarded against trachoma. In foreign treaty ports where the United States government maintains a marine hospital surgeon, during the fiscal year July 1, 1907, to June 30, 1908, 6,400 aliens, would-be passengers, were discovered to have trachoma, and their rejection was recommended to the transportation companies, that is, all were refused certification for embarkation.

Trachoma in England at the present time is an alien disease, imported by aliens, propagated amongst aliens and handed on to the native population by aliens. So Mr. J. Herbert Parsons wrote in 1904, and added somewhat bitterly, "Consistent with England's well-earned reputation for philanthropy, we are indeed acting as a trachoma filter-bed to the United States." The aliens immigration law failed to pass in that year in London. Like some other filters, this one would appear to be somewhat leaky. The number of aliens entering at the port of New York during the fiscal year 1908-1909 was 724,757, among whom 1,083 cases of trachoma were discovered, and during the same year among all aliens entering at the various ports of the United States 2,084 trachoma subjects were stopped or debarred, which is one-fifth of the whole number of aliens denied entrance during that period. In 1909 in New York the Municipal Board of Health had figures representing in that city 7,090 cases of trachoma, a number which will admittedly decline under more stringent methods of diagnosis. These data would seem to be sufficient to indicate how exceedingly important it is that the hands of the immigration authorities should be upheld in their well-directed efforts to check further introduction of this disease into our own country, where, unfortunately, it has already gained too firm a foothold.

Time does not permit a discussion of the methods which must be employed. They include, or should include, and happily often do include, rigorous inspection of aliens, equally rigorous inspection of children entering public schools, the establishment of isolation hospitals, or, at least, of wards where isolation of trachoma patients may be carried out, house-to-house inspection in crowded tenement quarters, as it may be accomplished by social workers and the employes of college settlements, and the vigorous exclusion of those who are affected from coming in contact with those who are not affected. While all laws should be administered with decency and with due respect to humane principles, it is the greatest possible mistake to permit unwise sentiment to hamper the authorities in their struggle for the elimination of this disease.

While it does not frequently produce total blindness, it produces, not infrequently the greatest disability of vision and destroys the

working efficiency of the subject it attacks, rendering him at the same time a menace to his neighbors and to his family. A disease which was able more than the Marmalukes and their allies to defeat the great Napoleon on the plains of Egypt is not a disease that must be treated with anything but the most vigorous methods.

Again time does not permit the discussion of other causes of acquired blindness, notably that great class of cases to which the term "industrial blindness" is constantly applied, nor the methods which factories, manufacturing institutions, mills, etc., must and should take to prevent their workmen from losing or marring their vision in the course of their labors. This would constitute a separate and a long chapter.

So, too, it must not be forgotten that school inspection is of the utmost importance in early detecting that disease so common among children of strumous habit, and surrounded by imperfect hygienic conditions, and often subject to the evils of bad dietetic regimen, which is called phlyctenular keratitis, and which in all probability represents one of the attenuated forms of ocular tuberculosis. It would be most interesting if one could trace with high commendation the excellent new methods of handling this disease which social workers of large hospitals, like those of the Massachusetts General in Boston, of the University Hospital in Philadelphia, and many others, have ordained. In this work these children thus affected are brought together in classes, exactly as are the tuberculosis subjects, and their whole habit of life regulated by personal care from the social workers. Since this technic has been introduced, for example, in my own service, there has been a notable decrease in the ravages of this affection. True, it rarely, or practically never produces total blindness, but the scars that it leaves upon the cornea only too frequently condemn its subjects to the misery of imperfectly seeing and therefore imperfectly working eyes.

I cannot say too much in favor of our modern school inspections, because not only is it possible through them to eliminate the influence of some of the diseases to which I have made reference, but because in its earliest stages the presence of the errors of refraction are found, and corrected, and thereby the influence, the most potent influence, of this condition of affairs is taken from the children. I have no doubt that as time goes on and these inspections become more perfect, much of the misery of so-called eye-strain and the evil effects which it produces, not only on the health and happiness of its subjects, but upon the vision of their eyes, notably in the creation of progressive and malignant forms of myopia, will be eliminated, and we may have a reasonable hope that in future generations eyes will be better constructed and less liable to some of these affections.

Care of the Blind Child. We have now to consider for a few moments the care of the blind

child, or perhaps, in a broader sense, his education. In the words of Sir James Crichton-Browne, "It has been demonstrated that blindness can be circumvented, and that the blind by special education can be lifted out of their blindness and can be prepared for future usefulness and independence."

There is a disposition to put blind persons in a class. "Indeed," in the language of Mr. E. E. Allen, "in the public mind lack of sight naturally creates a class, but the blind must not be lumped together. They should be considered to be made up of individuals who differ among themselves quite as much, if not more, than other people." It should further be remembered that careful observations show that blind children, as Mr. O. H. Burritt¹¹ has well shown, are at least two years behind seeing children of identical age, that the blind child does not walk at as early an age as the child with sight, that the blind child cannot attend to the simple little necessities of the toilet, for example, cannot, or usually cannot, wash and dress itself at the same age that a seeing child can, that a blind child of necessity, because it has always naturally been helped, rarely acquires the sense of self-dependence. Therefore from the very beginning in the home, before the child enters an institution, or if the child comes young to any institution, education along these lines should begin and every effort should be made, as Mr. John Cadwalader puts it, to educate these unfortunates, in the sense of self-dependence.

Now I cannot in this brief period take up the questions of the education of blind children either in their relationship to seeing children, or in their relationship one to the other in so far as the period of their blindness is concerned, or in so far as the forwardness or backwardness of their mental processes affect the problem. We should, I think, once for all understand that the notion that the loss of any special sense of itself improves remaining senses is not warranted by facts. Indeed, it is probable, as Mr. Armstrong has pointed out, that the loss of sight tends to make other senses less sensitive. Now this being the case, I believe that much could be accomplished in the great institutions devoted to the education of the blind and much additional good work could be added to the splendid record which they have already made if with each institution there was associated a psychological laboratory and a trained psychologist. Mr. Allen quotes one of his instructors thus: "In order to be a successful teacher of the blind, it is essential to follow Rousseau's advice, 'study your pupils more, for I tell you you do not understand them'." Now it is just this study of the pupils which could be materially helped by a sensible application of the principles of modern psycholo-

¹¹ New Opportunities for Blind Children Before Entering School. A paper read before the First International Congress of Mothers on the Welfare of the Child, Washington, D. C., March 10, 1908.

gical research. This subject I have studied a little particularly with the efficient Superintendent of the Pennsylvania Institution for the Instruction of the Blind at Overbrook, Mr. Burritt, and I agree with him that the establishment of such psychological investigation would bring about practical results. With the right man in the place, who would not permit his regard for strict scientific investigation to shunt him from the practical bearing of his studies in the education of blind boys and girls, such problems as the proper classification of blind children according to the degree of their mentality, the effect of partial sight, the bearing on the future careers and education of the children which the age at which they become blind exercises, the differences between those who have always been blind, or who has been blind from early childhood, and those who become blind later in life, the quality of the sensitiveness of the unaffected senses, would find a more ready solution in the future than they have in the past. As Professor Angell has written me, "I think the most useful line of approach is one which would involve the careful study of the development factors in the minds of the congenitally blind, with a comparison of the mental conditions of those who lose their sight at various stages along the age line." I am not sure, but I think it is not improbable, and in this Professor Witmer of the University agrees with me, that with the collection of accurate data in many institutions much help could be rendered to those who have in charge the vexed problem of the best alphabet for the blind, and I believe that the Uniform Type Committee of the Association of Workers for the Blind would welcome such an investigation. I suspect also that it would help in the solution of another question which agitates the workers among the blind, namely, how to deal with the backward or mentally deficient child, and whether or not he shall be included in the general class, or be separated into what the Germans call "abschluss Klassen."

Those who are congenitally blind, or who have attained blindness at an extremely early age, are necessarily timid, helpless, lacking in decision, and often somewhat mentally inert and defective, because of lack of stimulation of their visual centers, the main channel of which has been blocked, but to quote Sir James Crichton-Browne, "many other inlets remain open, and they may by educational engineering, be utilized, widened, extended, multiplied, until the visual center has all that is requisite to enable it to shake off its lethargy, to expand, and to perform its associative if not its primary function." Naturally, I am most familiar with the work at the Pennsylvania Institution for the Instruction of the Blind, and therefore I may be permitted to speak of what is sometimes known as the "Overbrook idea," where the fundamental motive in teaching is an appeal to the motor centers. As Mr. Samuel H. Bishop has

said,¹² "blind children are lacking the main agent of observation, therefore the power of observation of that class of pupils is small, and they must be reached chiefly through their motor centers; they must learn by doing, and the power of acquiring is stimulated through action." He takes as an example the teaching of geography, where each pupil makes his own map with cushioned paper and brass-headed tacks, points being located on scale measurement, and later outlined paper maps are supplied in abundance in the printing office.

Although stimulation of these motor centers is so important, necessarily education is not confined to waking up their activities. Not long ago it would seem that the blind must be contented to learn how to cane chairs or make mattresses or brooms; now we know that by reason of practical and industrial education wide fields have been opened. They are sensitive, made happy readily, easily depressed, but when in any school the knowledge is disseminated that some one member of that school has gotten a good bread-winning education, the effect in elevating the happiness and effort of the remaining scholars is extraordinary. The over-cautiousness of the blind is well known. This has in largest measure been met by developing among the blind children a love of and an activity in athletic sports. Twenty-five years ago the first swimming pool as part of an equipment of a school for the blind was built at the Royal Normal College for the Blind in London; in 1907 our pool at Overbrook was established, the first, I think, for the exclusive use of the blind in this country, and it is an astonishing thing to see these blind children acting in all respects as seeing children do in this pool of water, astonishing, too, to observe how rapidly they learn to swim, and in learning how their confidence is improved and their initiative stimulated.

Accuracy and precision are secured perhaps nowhere better than in the bowling alley. It may seem amazing that blind children can bowl well and set up the pins accurately, but they do this. As Mr. Burritt has pointed out, they do it better than children who have only a little sight, because the latter having a little sight try to depend upon this, and fail in attaining what is the entire object of the bowling alley, the developing of tactile sense. But just as exercises within walls becomes irksome to seeing children, and for that matter to seeing grown-ups, so too, it may happen with the blind, and therefore out-of-door athletic sports are of the utmost importance, and it is astonishing to see the joy with which these children indulge in them, sometimes only with the simpler apparatus like a merry-go-round, but often in real track athletics, where, for example, the runner guides himself by holding onto a wooden handle attached by a short flexible chain

¹² The New Basis of Work for the Blind, *Century Illustrated Monthly Magazine*, May 19, 1909.

to a ring on a long piece of wire. The ring slips along as he runs, and by feeling and by sound he is enabled to maintain his course. As Mr. Bishop well puts it, "this type of exercise increases the blind boy's physical courage, as well as his confidence, and this increase of courage is not physical merely, but enters into the pupil's view of life and into his effort."

It is unnecessary to multiply examples. The effort which we make through stimulation of the motor centers and through the elevation of the child's confidence must be apparent. I cannot refrain, however, from pointing out one important method of dealing with the physical and to a certain extent the mental education of blind children, to-wit, the classes in gardening. Each child in the kindergarten, for example, has his own plot, which he cultivates with enthusiasm. The children themselves will testify, even in their earliest years and experience, and still more as time goes on and the gardening becomes a real occupation, that they not only have been taught how the seeds grow from the earth, and how the earth must be treated in order that the seeds shall grow, but they learn accuracy, they gain health, and in the language of one of them, "gardening gives us lots of pleasure."

It must not be assumed because in well-conducted schools for the blind the education of the hands through the various lessons which are taught, notably, in piano-tuning, caning of chairs, broom-making, massage and the like, is so constantly utilized in the development of the brain that the matter ends here, or that we make the mistake, which is sometimes only too evident in the colleges and schools to which seeing children go, of creating an over-importance in athletics, or that there is a too strenuous and early beginning of these athletic exercises. As Mr. Allen, quoting G. Stanley Hall, points out, "fundamental muscles must be brought into proper training and later on the finer accessory muscles, like those of the hands and fingers and tongue are taught their necessary function." When this lesson has been learned, the older children are prepared and fitted for other occupations, typewriting, writing and the like, and so with the development first of fundamental muscles and later of accessory muscles, the receptivity of the brain centers increases, and with stimulation of mental development, physical courage and confidence having previously been attained, many of these children are able quite well to take their place with seeing children in real school duties, and we find boys and girls attending with satisfaction to themselves and to their teachers classes in high schools, colleges and universities, graduating with distinction, and becoming practically as useful members of society as any one who has not been deprived of the sense of sight. Laboratory work excepted, many of them have become proficient in English history, ancient and modern languages, mathema-

tics, music, indeed, in any kind of school work that can be done without sight.

I would like to point out that because piano-tuning is one of the best of the bread-winning occupations to which the blind can turn, if a blind boy or girl shows musical ability, this is trained, but any teacher of the blind will testify that it is a mistake to force non-musical children into efforts intended to result in musical education. Blindness does not give musical ability, but it also does not destroy it; only if it is present does its training become important. Finally, it is with no little satisfaction that, for example, at Overbrook, we can point to the success of our graduates and to the long list of occupations with which they are concerned. Great care has been taken to trace the careers of our graduates, and 85 per cent. of all of them are succeeding. All manner of occupations, broom-making, chair-caning, business-house positions, massage, pianists, teachers of music, typewriters, field agents, social workers, tutors to the blind, etc., are represented. It is a long, satisfactory and inspiring list. These men and women, no longer in the class of "unfortunates," are useful, satisfactory, bread-winning members of the community. The sting of their misfortune has been removed; they have acquired the joy of self-dependence and of successful effort. Blindness has been circumvented.

THE PREVENTION OF DEAFNESS AND THE INSTRUCTION OF THE DEAF CHILD.*

By G. HUDSON MAKUEN, M.D.,

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BLINDNESS is a great calamity both to the young and old, but deafness is a far greater one, especially when it occurs in children. Good vision is a convenience in the intellectual development of the child, but good hearing is an absolute necessity.

Blindness affects but a single cortical center of the brain, namely that of vision, while deafness affects two cortical centers, that of hearing, directly, and indirectly that of speech; and of all the cortical centers, these two are probably the most important. The sense of touch may be substituted for that of vision with comparatively little detriment to mental development and intellectual progress; but even the modern methods of teaching the deaf child have not succeeded in furnishing a satisfactory substitute for the sense of hearing, while in the untaught deaf child, the brain tissue which forms

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

a basis for all intellectual progress actually suffers arrest of development to such an extent as to be demonstrable by means of the tape measure and scales.

THE PREVENTION OF DEAFNESS AND THE INSTRUCTION OF THE DEAF CHILD.

The subject naturally divides itself into three parts, which I shall put in the form of questions. (1) To what extent may deafness be prevented? (2) How can it be prevented? and (3) What shall we do for the children who are irrevocably and irreclaimably deaf?

TO WHAT EXTENT MAY DEAFNESS BE PREVENTED?

A great obstacle to the prevention of deafness is the almost fiendish insidiousness of the affection. It comes on without warning, and sometimes it becomes an established fact before the physician or even the patient is aware of it. This is particularly true of infantile deafness, a form which is especially serious because of its interference with the development of speech.

The careful seclusion of the organ of hearing within the petrous portion of the temporal bone, Nature's beneficent plan for protecting it from injury, renders the approach of diseased conditions much less obvious, and remedial measures for their relief much more difficult. However, notwithstanding all this, I am convinced that a considerable percentage of the deafness that has existed in the past and that will exist in the future might have been and may be prevented.

A very distinguished otologist, and one who has given much attention to this subject, has said that 50 per cent. of the deafness in the school children of England is curable, and I am of the opinion that an equally large percentage of the deafness in school children generally is preventable.

HOW CAN DEAFNESS BE PREVENTED?

If I could give you a specific recipe for the prevention of deafness, I should be at once conferring upon you an unutterable blessing and rendering my own name immortal; but the fact is, there is no specific recipe for the prevention of deafness and there never will be until the human race, unlike all other things in nature, has reached perfection.

Deafness is a symptom and not a disease, and just as long as the human organism is subject to disease, just so long will there be the symptoms or results of disease, of which deafness is a type.

There are two kinds of deafness to be considered in this connection, viz., that which is a part of the inheritance of the child, or congenital deafness, and that which is the result of disease later on, or acquired deafness. This is a more or less arbitrary division, for nearly all

deafness is acquired either before or after birth, and the child inherits merely a tendency to the acquisition of certain morbid conditions which result in deafness, and which may be of either prenatal or post-natal development.

PREVENTION OF CONGENITAL DEAFNESS.

Congenital deafness, and to a great extent also acquired deafness may best be prevented by a more careful selection of parents for our children, or in other words, by a stricter application of the principles of eugenics to this condition. In view of the fact that about 50 per cent. of congenital deafness is the direct product of consanguineous and deaf mute marriages, is it not time that something in the way of legislation should be done about it, and are not we, members of the medical profession, the ones to take the lead in doing it?

THE PREVENTION OF ACQUIRED DEAFNESS.

Man is endowed by Nature with two or three times as much hearing as he actually needs, and therefore, a considerable portion of it may be unwittingly lost. Moreover, it is well known that hearing power once lost is not easily regained, and as someone has said, the best time to cure deafness is before it begins. Having these things in mind, some of us advocate a periodic examination of the ears after the manner of our practise in respect to the eyes, in order that we may detect and combat diseased conditions in their very incipency.

Acquired deafness in the majority of instances is the direct result of diseases of the ear, and these diseases may be either primary or secondary. Primary diseases of the ear are those which originate in any portion of the ear, including the naso-pharynx, and secondary diseases of the ear are those which result from extraneous causes, such as the infectious fevers of childhood.

The prevention of primary diseases of the ear offers a wide field for the otologist. All children are born deaf as well as blind, and their tympanic cavities are filled with "loose œdematous connective tissue," which must be absorbed before hearing power can be developed. This leads to a consideration of what is probably the most important immediate and predisposing cause of acquired deafness, namely, an inadequate ventilation of the tympanic cavities. Upon this factor alone many other pathological conditions are based, and therefore, the causes which lead to it should be promptly and vigorously attacked.

Inadequate tympanic ventilation is the direct result of two physical conditions, (1) faulty respiration, and (2) faulty action of certain palatal muscles; and these two physical conditions are in turn the direct results of naso-pharyngeal obstructions. If I were asked to

name the most important measure for the prevention of acquired deafness, I should unhesitatingly declare it to be the normalization of nasal respiration and the restoration of palatal efficiency by a careful correction of septal and other nasal deformities, and the careful removal of diseased adenoids and tonsils.

Another less frequent and secondary cause of acquired deafness is infection through the eustachian tube as a result of so-called nasopharyngeal catarrh, a condition which is often dependent also upon faulty respiration together with its concomitant faulty drainage.

These local pathological conditions of the various parts of the ear, including the nasopharynx, are the predisposing causes of ear disease and deafness, and their timely removal is an important measure for the prevention of the serious ear complications accompanying the infectious diseases of childhood.

It has been estimated that two-thirds of all ear diseases are the results of measles or scarlet fever, and as has been truly said, these are the preëminently preventable cases.

In these days of antitoxines and vaccines, it is not too much to hope for at least a diminution of the devastating infectious diseases of childhood, including cerebro-spinal meningitis; and in these days of advanced otology, the prevention of the ear complications of these diseases can be only a question of a fuller application of the remedial measures at our hands.

The day has passed when the ear symptoms accompanying the infectious diseases of childhood can possibly be overlooked or neglected by the conscientious practitioner of medicine. He must know the right thing to do and he must do it at the right time. The opportunity for the prevention of deafness in these complications generally comes but once, and when it comes promptitude of action must be our motto. The danger signal, of course, is pain. Nine times out of ten, an earache calls for the knife rather than for anodyne drops, which only mask the symptoms and mascerate the drums. Paracentesis is one of the most important operative measures for the prevention of deafness, and it has probably saved more ears than any other single procedure.

The key to this whole situation is largely in the hands of the general practitioner of medicine, and he it is who more than any one else can, if he will, open the door to progress in this direction. Indifference on the part of the general practitioner and ignorance, or a general and perhaps natural prejudice against all operative measures on the part of parents are the greatest obstacles to progressive measures for the prevention of deafness, and it is our duty as general practitioners and as special practitioners of medicine to disseminate as widely as possible among our patients the truth with reference to these mat-

ters and thus to unite in a common effort to save the hearing of future generations of children.

INSTRUCTION OF THE DEAF CHILD.

I see that I have left to me just ten minutes to discuss the instruction of the deaf child, and in as much as it would take at least as many hours to do justice to the subject, I shall be able to deal with it only in a very general way. As has been well said, if the principles of negative and positive eugenics were strictly applied to congenital deafness, and if rational measures for the prevention of acquired deafness could be generally adopted, we should have fewer deaf children on our hands; but until this time has come, we shall have the problem of the instruction of the deaf child before us, and we must face it for humanity's sake as well as for civic and economic reasons.

The term deaf child as here used must include those children ranging all the way from the slightly deaf to the very deaf, or the so-called deaf mutes. Those whose deafness is so slight as to interfere but little with their school work can best be educated, of course, with hearing children; but for those who can with difficulty hear the teacher, special classes should be provided.

The so-called "semi-deaf" or those having a remnant of hearing but not enough to hear speech either subjectively or objectively, and the so-called "semi-mute" or those having acquired deafness after the acquisition of speech but whose speech is not sufficiently established to become a permanent possession in the absence of hearing, may well receive their instruction together, under specially trained teachers in the public schools, but under no circumstances should the semi-deaf and the semi-mute be classed with the slightly deaf on the one hand or with the so-called deaf mutes on the other.

Moreover, it should be borne in mind that the children to whom I have referred differ from other children only in respect to their lack of normal hearing power and their defective speech. It has not been shown positively that deafness in itself affects in any way the mentality of the child. In our provision for atypical children, therefore, which must come as a result of the medical inspection of schools now in vogue, it is not enough to classify them according to their particular grade in school, but it is desirable rather to classify them according to the physical and mental characteristics which happen to be the cause of their position. A deaf child and a feeble-minded child may be equally backward in school, but it is manifestly unfair to both to have them placed in the same class. A deaf child, although he may also be dumb, soon learns to appreciate the fact that notwithstanding his physical disability, he is mentally on a par with normal children, and to associate him with feeble-

minded children for educational purposes is to say the least dispiriting, and it tends to destroy his natural ambition for studious application.

Deaf children, therefore, should be classified according to the degree of their deafness and also to some extent according to the character of their mentality. This classification is now adopted to some extent in our own country as well as in one or two of the smaller countries of Europe.

INSTRUCTION OF THE VERY DEAF OR DEAF MUTE CHILD.

The very deaf child differs from the normal child only in respect to his deafness and consequent incapacity for the acquirement of speech without special assistance. In the untaught deaf mute child, we have a striking illustration of the fact that speech is man's most distinguishing characteristic. The deaf child more than any of the human species resembles the young of the lower animals. Possessing as he does by inheritance every potentiality for mental and physical development, he is nevertheless to all outward appearances just a little animal.

Taking these things into consideration, you will readily understand that the most important period of the deaf child's life is that from two to seven years, the period during which hearing children naturally and physiologically acquire some command of oral language. As Kerr Love has pointed out, the deaf child usually begins school at seven years in the intellectual condition of the child of two, and this is physically expressed by his relatively smaller head.

HOME INSTRUCTION OF THE VERY DEAF OR DEAF MUTE CHILD.

The very deaf or deaf mute child has the same capacity for receiving instruction that other children have except for the fact that the hearing center of the brain is inoperative.

The home instruction of the deaf mute child should consist chiefly in an effort to make the visual and tactile centers of the brain take the place of the inoperative hearing center in the reception of oral language. The deaf child, therefore, should be talked to and talked at as much as possible and on every possible occasion. He should have more attention of this kind, and not less as is usual, on account of his deafness.

The instruction of the deaf child should begin at the earliest possible moment, and it may best be given by the intelligent mother or governess under the direction of the physician or specially trained teacher. The oral method should be employed and the natural sign language should be used only as an adjunct, or as some one has said as a "crutch" to be laid aside as soon as possible. This method of instruction carefully and vigorously practised will bring the deaf child to the school age with a fairly good practical knowledge of lip-reading and with a fairly good working vocabulary of words.

SCHOOL INSTRUCTION OF THE VERY DEAF OR DEAF MUTE CHILD.

The school instruction of otherwise normal deaf mute children may well be conducted in special day school classes, thus avoiding the necessity of removing them from their home environment and from their association with hearing people. At this period of their instruction, a suitable classification is desirable, so that the methods employed may best meet individual needs.

At least three classifications of very deaf children should be made. In the first class should be placed the mentally gifted ones, by whom the oral language may be easily acquired, in the second class, the less gifted ones to whom a combination of the oral and sign language may be best suited, and in the third class, the defective ones, including the blind and the mentally deficient who may not be able to acquire speech at all. The first and second classes should be especially provided for in the public day schools, and the third class should have institutional treatment, followed perhaps by more or less permanent supervision.

I would postulate the needs of very deaf children as follows:

1. An earlier beginning of their instruction.
2. A closer association with hearing children.
3. A more scientific classification for educational purposes.
4. A more satisfactory adaptation of methods to the individual mental capacity of the child.
5. Home environment and day school instruction for all except the mentally deficient and blind, who should be placed in institutions and kept there perhaps during their life time.

THE PRESENT STATUS OF THE MOVEMENT FOR THE PREVENTION OF TUBERCULOSIS IN THIS STATE.*

By HOMER FOLKS,

Secretary of the State Charities Aid Association.
NEW YORK CITY.

THIS morning the civilized world held its breath and looked out over the Atlantic a thousand miles to the spot where it is feared 1,600 souls went down to death yesterday. Would that we could similarly concentrate interest on the fact that in the Empire State alone each month a like number of human beings go down to death because of tuberculosis. Like the passengers of the Titanic, they come from every walk of life,—first, second and third class,—but go down to death equals. It is not even permitted to us to save the women and children, or to give them the first chance.

* Read at the Annual Meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

"When the wireless call went to the nearest boat, about 170 miles distant, pushing at full speed, it took some eight hours to reach the scene of the disaster. It must have seemed a long time, and yet the distance and the time were as nothing compared to the distance and the time separating the sufferers from tuberculosis from their would-be rescuers. It is many times further, for example, from the slums of any city to its City Hall than it was from the Titanic to the Carpathia or the Virginia. It takes as many years to get help from headquarters to the poorer sections of our smaller cities and rural districts as it did hours to get to the Titanic, only in this case we are contending not against the forces of nature, not against the limitations of mechanics, but against the ignorance and indifference of men.

"The mists and fogs of the Newfoundland banks are clear sunlight compared with the confusion and misunderstanding separating human beings from each other, paralyzing the natural flow of sympathy for the distressed, and staying the strong right arms of those able to help. May the deep feeling and sense of human unity evoked by the dramatic loss of the Titanic remain a permanent asset of the humanitarian forces of the world."

Various measures looking toward the prevention of tuberculosis were taken by the health department of New York City, by individuals and societies of the medical profession, and by other agencies several decades ago. It was not, however, until 1902, ten years ago, that a permanent central committee, representing both the medical profession and the laity, public officials and private citizens, was organized to co-ordinate existing agencies and to push the movement in all its aspects with renewed vigor and determination in New York City. Similarly, here and there throughout the state, a public health officer, a good citizen, or perchance a medical society, for a period of several decades have seen the great opportunity to control the greatest cause of death, and have taken a hand. It was not until 1907, however, five years later, than in the city of New York, that a central committee to push actively the varied measures for the prevention of tuberculosis in all parts of the state was organized. The State Department of Health and this Committee on the Prevention of Tuberculosis of the State Charities Aid Association have since that time pushed the movement energetically in every county of the state. Certain sharp distinctions in the conditions under which these two movements are carried on stand out clearly, all of them making for greater facility of accomplishment in the metropolitan city. In New York City we have one health officer with a staff of experts and laboratory assistants; in the remainder of the state, with substantially the same popu-

lation, we have fourteen hundred health officers, representing all degrees of proficiency and largely without staff, combining in their own person administrative, educational, and expert resources. In New York City we have one city government to provide the needed funds; in the remainder of the state we have 57 counties, 48 cities, and hundreds of villages and towns, each of which must be interested and brought to the point of action. In New York City we have the centralized financial resources of the country; elsewhere we have the more slender resources of private generosity. In New York City we have a great health department, with prestige, authority, accustomed to act and to have its action accepted by the community; elsewhere we have, as a rule, health officials struggling for the bare necessities of administration and fearful of offending public opinion.

Notwithstanding these inherent and irremovable difficulties in the situation, a very substantial degree of progress has been attained. Being far better acquainted with the details of the movement outside of New York City, I shall speak chiefly of that.

First, as to hospital care. In 1907, comparatively little stress was laid on hospital provision as a preventive agency. After the International Congress on Tuberculosis in October, 1908, however, that became the most important single objective. In 1907 there were, all told, seven agencies offering hospital and sanatoria provision for tuberculosis outside of New York City—three private sanatoria, the State Hospital for Incipient Tuberculosis at Ray Brook, the Municipal Hospital at Rochester, and the almshouse hospitals in Erie and Westchester counties. These seven agencies had a combined capacity of 444 beds. To-day there are 22 hospitals in actual operation in the portion of the state outside of New York City, with a total bed capacity of 1,276, as against 444 in 1907. Besides these 15 hospitals actually opened since 1907, 11 additional county hospitals with a total prospective bed capacity of 676 are definitely assured, six of these counties having selected sites and being engaged at the moment in the consideration of plans and specifications; and the other five having taken definite and conclusive action on the project and being now engaged in the selection of sites. Five additional cities have definitely authorized the construction of municipal hospitals with a total prospective bed capacity of 467, a total additional bed capacity definitely assured of 1,143.

Second. Dispensaries. From the beginning it has been recognized that one of the chief factors in the prevention of tuberculosis is what, for want of a better name, we call the tuberculosis dispensary, the outpost from which cases are discovered or to which they find their own way; at which they receive examination, information and advice, and from which they may secure free

admission to suitable hospitals, if such be available, or some degree of sanitary oversight and assistance at home. In 1907 there were two such dispensaries in the state of New York outside of New York City, in Yonkers and Rochester. To-day there are 23 special tuberculosis dispensaries in actual operation, some of them carried on by municipalities, and some of them temporarily by tuberculosis committees.

Third. Visiting Nurses. Our experience during the last few years has led us to place vastly increased emphasis on the visiting nurse as one of the most important factors in the tuberculosis movement. At first we thought of her chiefly as a useful adjunct to the tuberculosis dispensary, as one who, starting from that point, would visit patients, instruct them and their households under the physician's advice, and, in suitable cases, assist in securing hospital admission. We have come to see, however, that the visiting nurse is vastly more than this; that she is in fact one of our most valuable agencies in finding out where the vast number of uncared-for tuberculous patients are. Much stress has been laid on the registration of cases by physicians, and justly so; but, if every physician in the Empire State to-day reported all cases under his professional care, an overwhelming majority of cases would still be unrecorded, unknown and uncared-for. The assumption that most sick people are receiving medical treatment is contrary to the fact. Save for the small proportion who enter hospitals, vast numbers of wage earners, farmers, and persons of moderate means do not know when they need medical treatment; or, if they do recognize the fact, do not act upon it so long as they are able to carry the burden of the day's work. The visiting nurse has proved to be a more effective agency in securing registration of cases than the dispensary, the exhibit, or the medical profession. She goes out into the highways and hedges and compels them to come in. If she has initiative, resourcefulness, tact and energy, it does not require much compelling. By getting closely into touch with patients already known, by listening to the household gossip, by interviews with teachers, by attending meetings of all sorts of social agencies, and in countless other ways which her ingenuity devises, she finds out where at least the advanced cases are, finds her way to them and brings them into touch with the chain of relief and professional agencies established for their benefit and care. In no other respect has the degree of success been so encouraging as in this, at least during the past five years. In 1907 there were two visiting tuberculosis nurses outside of New York City; to-day, of such there are 49.

Fourth. Special Family Relief. It was early recognized that adequate charitable relief is a prime requisite. A sick man, able to do some work, will not desert his post unless his family are to be cared for. The instruction which the

visiting nurse gives cannot be carried out in the households of the poor, as a rule, unless additional facilities are provided. The patient obliged to remain at home, cannot husband his remaining resources of strength and vitality without food and shelter other than that which would ordinarily be given to the poor. In 1907 the number of localities in which special relief was provided for families in which there is tuberculosis, was two. In April, 1912, it is 27.

Fifth. Registration. The reporting of cases of tuberculosis by physicians to health authorities, required by the Sanitary Code in New York City for many years, was made mandatory for the medical profession in the state at large by the tuberculosis law in 1908. Substantial progress has been made under that law, though far less than I wish I were able to report. Such reports had been requested by the state health department prior to 1908. The number of living cases of tuberculosis reported to health authorities by physicians in New York state outside of New York City has been as follows:

1907, 2,576; 1908, 3,310; 1909, 5,639; 1910, 5,557; 1911, 8,786.

In 1909 for the first time, the number of cases reported exceeded the number of deaths. In 1911 it was more than 1½ times the number of deaths. In view of the fact that there are somewhere between five and ten living cases for each death, it is painfully apparent that the number of cases reported, though substantially increasing, is still not more than one-fourth of what it should be. I wish that from this State Medical Society there might go out from every physician in the state of New York an urgent message requesting him to be not only a good physician, but a good citizen and a good sanitarian, but faithful observing the requirements of the statute and reporting all his cases of tuberculosis to the health authorities. The medical profession has given such hearty co-operation in every other aspect of the movement that we have not the heart to speak with violence or bitterness of their degree of failure thus far in the carrying into effect not only the plain duty, but the plain letter of the statute requiring registration.

Sixth. Sanitary Supervision. Registration is but a means to an end; that end is the effective sanitary supervision of cases of tuberculosis who, for any reason, must remain at home, and the removal to hospitals of such as can go there. This duty of sanitary supervision is to be performed by the reporting physician, if he chooses, or by the health officer if the physician so prefers. This alternative was provided out of deference to the position and possible wishes of the attending physician. I wish that in every case he would choose, however, that this sanitary supervision be exercised by the health officer. In but few cases does the physician visit his patient with sufficient frequency to know whether

sanitary precautions are being observed in the household.

Seventh. Popular Education. I have left to the last, though it is perhaps the most important factor in the movement, though the most difficult to measure, *i. e.*, the bringing home to people of all sorts and conditions, in all parts of the state, of the essential facts about tuberculosis. This campaign of popular education has a double purpose—to bring the individual to a point at which he will recognize the early symptoms of tuberculosis in himself or associates, and to create a public opinion which will sustain public officers in making those expenditures, and taking those administrative measures which are essential for the control of tuberculosis. In this educational movement the State Department of Health has co-operated closely. The large exhibit of that department will have been shown by May next in every city in the state. Smaller exhibits have visited the greater number of the towns and villages, and have gone to the county fairs throughout the state. No precise measurement of such educational work can be applied. It can be said, however, that the number of copies of the leaflet stating the essential facts about tuberculosis, actually placed in the hands of individual people in the state outside of New York City during the past five years, is counted not by the hundreds, not by the thousands, but by the millions. The number of local committees, that is, village, city or country committees, organized at the close of tuberculosis exhibitions to continue and to push the tuberculosis work in their respective localities, is 263, with a total membership of public-spirited citizens of 8,816. A sidelight on the effectiveness of such an educational campaign is shown by the recent election in the city of Seattle. There, among 34 different propositions submitted to the voters of the city at the recent election, one proposed an issue of bonds to the amount of \$125,000 for a tuberculosis hospital. That, in a city of 250,000 people, would be the equivalent of a bond issue of \$2,500,000 in the city of New York, or of the same amount in the portion of New York state outside of New York City. This proposition received a larger affirmative vote than any other proposition of any other nature or character whatever going before the people. 39,014 people voted for it, and only 8,831 against it, an affirmative vote of more than 4 to 1. It is evident that in this respect at least, the men of Seattle, as well as the women, did their duty.

Results. It is inevitable that those active in the movement and the public at large should begin to ask, "Does the actual death rate show any evident effect of all this work?" I wish I could say that it does. I do not think, however, that such is clearly true. The death rate from tuberculosis is falling off both in the city and in the state. It has been falling, however, before this movement was begun, and I do not

see that we can claim that as yet the decrease has been notably accelerated. The number of deaths from pulmonary tuberculosis in New York City and in the portions of the State outside of New York City, from 1900 to the present, as shown by the annual reports of the State Health Department is as follows:

Year.	Greater	State of
	New York.	New York.
	No. of	No. of
	Deaths.	Deaths.
1900	8,162	5,429
1901	8,141	5,625
1902	7,589	4,993
1903	8,003	5,191
1904	8,516	5,642
1905	8,532	5,527
1906	8,976	5,051
1907	8,996	5,410
1908	8,867	5,449
1909	8,645	5,303
1910	8,692	5,208
1911	8,790	5,389

The conclusions to which some study of these figures lead me are these:

1. The irregular variations from month to month and from year to year, suggest very strongly to me that we have not yet arrived at a complete, prompt, and accurate recording of the actual number of deaths from this cause.
2. That one of the first results of a campaign of education is apt to be an apparent increase in the number of deaths recorded as being due to pulmonary tuberculosis, because of a more accurate diagnosis, and less readiness to ascribe a tuberculosis death as due to some other cause out of consideration for the family or the attitude of an insurance company.
3. That the constructive measures for the prevention of tuberculosis have not yet been in operation for a sufficiently long time to show any marked effect on the actual number of deaths.

I am one of those, however, who confidently expect to see, within the next decade, a very evident and substantial decrease. I accept the hopes expressed by Phillip of Edinburgh in his cable message concerning the program for anti-tuberculosis measures adopted by the conference of Tuberculosis Committees in Albany in March, 1910:

"Prosecute great campaign proposed: watch child as potential tuberculosis seedling; correct faulty compulsory environment, and expect 40% reduction by 1920, and practical disappearance within a generation and a half."

One of the most important indirect effects of the tuberculosis campaign is the changed attitude on the part of the community toward the medical and nursing professions. We are, it is true, putting new duties upon physicians, but we are

also educating the community to appreciate its physicians and nurses and to employ them. This employment in the tuberculosis cause is rapidly coming to be public employment. We recognize that the patient, irrespective of the amount of his resources, should be cared for, not only for his benefit and protection, but for ours. Just as we pay school teachers out of public funds to make us wise, we are learning to pay physicians and nurses out of public funds to keep us well. I am not prepared to say that at this time we should go as far in making physicians public servants as we should in the case of trained nurses, though the lamentable fact is that the rich and the very poor are the only groups receiving adequate medical treatment at present. The wage earner, who shuns the pauper's oath as worse than death itself, does not obtain adequate medical advice and treatment, or, if he does obtain it, it is at an undue sacrifice. Not many years ago something of the same was true of education. High tuition charges in private schools cut off a large proportion of the population from educational advantages. The public school system, and even publicly supported colleges and universities, supplemented by private generosity, have changed all this, and education is now the privilege of all. The hospital, the visiting nurse and the dispensary are important for the prevention of tuberculosis, but they are also important for the care and prevention of other diseases. To a considerable extent these activities are now carried on through private philanthropy, but even the demands of the tuberculosis cause are rapidly carrying them beyond the resources of private charity. More and more the dispensary, the hospital, and the visiting nurse are becoming public enterprises of the town, the village, the county, or the city. At least nine cities outside of New York employ a special tuberculosis nurse, and pay them from municipal funds. These are Amsterdam, Buffalo, Cohoes, Dunkirk, Syracuse, Hudson, Rome, Schenectady and Niagara Falls.

The time has come, in my judgment, when legislation should be had requiring the employment in every city and town of the state, paid from public funds, of a visiting nurse, for each suitable number of population. The State Grange, representing more than 100,000 farmers, recently adopted a report recommending the employment by local granges of visiting tuberculosis nurses until such time as they could be taken over by the local public authorities. The State Federation of Women's Clubs, representing 223,000 members, has undertaken similar work in a number of the cities and villages. These straws indicate the direction in which the wind is blowing. It is a short step from the performance of public health work by such large and influential groups to its assumption by the largest group of all—the people of the respective cities, towns and villages of the state. The in-

direct contribution to the public health movement made by the tuberculosis campaign may easily prove to be its most important results.

When in March, 1910, at a conference of local tuberculosis committees, held in Albany, a program of constructive measures, summed up in the phrase, "*No uncared-for tuberculosis in 1915*," was adopted, it was an expression of hope and determination rather than a prediction. From the numbers of dispensaries, visiting nurses and hospitals already provided or under way, we are now able to hold out definite encouragement that, if we keep of good courage, continue to increase the number of active supporters of the movement, and do not lose any of our enthusiasm or determination, we shall by the end of 1915, be able to announce the realization of our hopes. We shall, of course, be far from the end of our efforts, but we shall have set into action on a reasonable and adequate scale all those agencies which you men of medicine and of science tell us will accomplish the desired result.

THE PREVENTION OF INSANITY.*

By ALBERT WARREN FERRIS, A.M., M.D.,
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THIS is the age of preservation, conservation and prevention. For generations improvements in the stamp mill and the cupel have resulted in extracting every particle of precious metal out of formerly rejected tailings of low grade gold and silver ores. For many years studies have been made of the forests in order that methods may be elaborated whereby fallen timber may be removed and utilized and standing timber may be judiciously cut and that reforestation of denuded areas may be accomplished. For a long time attention has been given to orchards with a view to improving and enlarging the fruits and protecting the trees from blight and parasites. For a generation former waste heaps of culm surrounding the mouths of our coal mines have been worked over, and minute sizes of fuel have become marketable, through the employment of special grates and air blowers or steam blowers. Our forefathers practiced careful breeding of cattle and protected and registered certain stock in order that the breed of milch cows might become more efficient and valuable.

Now, having cared for our trees, our mineral resources, our fruits and our horned cattle, we finally secured a very little time to give to the preservation of the human race and the conservation of our children.

And yet, prevention is not new. For many years vaccination has been reasonably and con-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

sistently utilized as a preventive measure against smallpox. In these days we use many sera which have been devised to combat various contagious diseases such as the serum against the dread cerebro-spinal meningitis, the serum against bubonic plague, the diphtheria antitoxin, the serum valuable in resisting the inroads of typhoid fever, which has reduced enormously the invasion of that disease and has rendered much lighter the cases of the few who, although inoculated with the antitoxin nevertheless are attacked by the disease. The public conscience has been awakened to an appreciation of the general principle of prevention.

Hence the campaign against tuberculosis, splendid, vigorous and destined to be successful. Similarly necessary, parallel in its interest and of surely as vital importance is the campaign for the prevention of insanity.

That a campaign against an abuse or a custom or a disease shall be successful, it is necessary that three conditions shall exist:

1. There must be an authoritative statement of facts.
2. The cause espoused must appeal to the taxpayers as a matter of economy.
3. The cause and the proposed remedy must appeal to the general good sense of the people.

The campaign for the prevention of insanity fulfils the three demands. It certainly appeals to the people. What family is free from insanity? Who is there who knows his family for four generations, who will affirm that there is no insanity in his ancestry and none among his connections by marriage? What spectacle is more sad, more appealing, than that of an overworked man or a self-sacrificing mother, who has become insane through an inheritance which slumbered till stress and strain weakened the individual and consequent arterial changes occurred?

There is an idea prevalent among some to the effect that it is largely the worthless and the useless who become insane. Nothing is further from the truth. In this state over 77 per cent. of the insane in the state hospitals are above the grade of day laborer, or are their wives or minor children. They were producers and taxpayers and are deserving of the greatest consideration.

The appeal to the taxpayers on behalf of prevention of insanity is very briefly made. Out of a revenue of about \$39,000,000 the state spends annually about \$8,000,000 upon its insane, and it should do so. But what is to be the future expenditure? An additional half million each year? Is it not worth while to spend something in an attempt to limit the production of insanity?

Let me state to you the facts in the case. In the census year of 1910 the population of the state was ascertained to be 9,113,279, and in that year the insane under care numbered 32,658. Twenty years previously, the number known of insane was 16,006, while the state's population

was 6,171,586. Thus in twenty years the population had increased 47.6 per cent. while the number of known insane had increased 103.9 per cent. This does not necessarily denote a disproportionate increase in insanity, for various reasons. There is probably no such increase. But the figures are important and should impress every citizen of the commonwealth.

Each year over 6,700 cases of insanity are admitted into the state hospitals for the insane, providing us with a net increase of about 1,000 annually. Think of a parade of soldiery in New York City, embracing the following regiments: the 7th, 22nd, 69th, 71st, Troop A, Troop C, the 23rd and 13th of Brooklyn, and you are contemplating about as great an army as that of insane men and women and youths, which marches into the state hospitals annually. Each year, about 28 per cent. as many as are received are discharged recovered. It is plain to be seen, therefore, that care and treatment do not meet the necessities of the situation. Are we to look forward calmly to an increase of 1,000 each year for perhaps the next ten years, and at the end of that time to have 43,000 patients under our care in place of 33,000 as at present? The only logical view to take of the whole matter is to contemplate ascertaining the avoidable or manageable causes of insanity and then to limit its production.

The campaign of prevention of insanity in New York State has been well launched, and is now being carried on by the Special Committee on Mental Hygiene of the State Charities Aid Association. Obviously the greatest headway can be made by plainly stating the facts regarding the avoidable causes of insanity. These are chiefly alcohol and syphilis.

Syphilis is the determining cause of general paresis, and Dr. Thos. W. Salmon has shown that in 1910 the number of deaths from that disorder in New York State equaled half as many as those from typhoid fever. General paresis cases constitute 12 per cent. of our new cases of insanity. Syphilis produces other fatal conditions. It is accountable for a variety of arterial disease and a variety of meningitis, both of which result in insanity. The harvest it gathers is very large, even appalling.

Many cases of syphilis, taken in the early period of the attack are curable under protracted and skillful treatment; but many cases in spite of the best treatment and the most favorable conditions never recover. The dangers of promiscuous sexual intercourse to which are exposed so many young men in schools and colleges, as well as in after life, can not be too gravely or too frequently emphasized. It is the common custom in all classes of society, unfortunately, to smile at and forgive young men who lead lives of alcoholic and sexual indulgence, and we often hear the statement, "He is simply sowing his wild oats." There are in our

state hospitals probably 5,000 men who owe their insanity to sowing wild oats. This is indeed a startling harvest.

Alcohol, as we must iterate and reiterate, is the determining cause of by far the largest number of insane cases. It is the precipitating factor in fully 30 per cent. of our total number of male insane.

It is an undeniable fact that alcohol is a stimulant poison. That it has a certain food value in certain cases is claimed, but it never fails to exert a toxic effect. In large quantities it is a dangerous poison; in smaller quantities it is a less dangerous poison. That is the most advantageous statement that can be made with regard to its use. Many people who take alcoholic beverages in so-called "moderation" are taking a sufficient amount not only to impair their digestive organs, but also to produce ravages in the brain tissue which can never be repaired, and which have for their results lowered intellectual and mental power, and not unfrequently permanent mental enfeeblement or insanity itself.

We cannot do better than contemplate the results of the careful investigations of the great master of psychiatry, Kraepelin of Munich, who demonstrated the paralyzing effect upon the mental processes of small doses of alcohol, also plainly proving the action of alcohol upon the offspring through its deleterious effect on the germ plasm. He demonstrates that moderate as well as excessive use of alcohol leads not infrequently to mental enfeeblement, permanent reduction of mental efficiency, defective offspring and to insanity.

Now for the remedy. What is mental hygiene? It is parallel with physical hygiene. If your child has a cough, or has a pallid face, or has a rise of temperature, physical hygiene is invoked to remedy the conditions. If your child is shy or seclusive, or subject to great emotional disturbance or given to "day dreaming," attention to these mental traits or attitudes constitute mental hygiene. It also embraces a study of environment, food, occupation, recreation and special susceptibilities and inheritances.

Laymen are aroused. Philanthropic people are giving their time and money for this good cause. The physicians are the ones that need arousing and stimulation. I earnestly urge upon you to study the matter. You cannot then fail to be interested, even fascinated with the possibilities of the campaign.

All available agencies such as dispensaries, clinics and hospitals should be used to the utmost. The family physician should be present at the staff meetings in the state hospital at which his patient is presented. For each patient received into a state hospital is made the subject of a staff consultation shortly after his reception. After about two weeks, he is again brought before such a staff meeting, and still again before

parole or final discharge. The hospital authorities welcome the presence of the family physician at these meetings, and urge their attendance.

Since over 6,000 patients are admitted during a year, several hundred physicians must act as medical examiners, under the provision of the law which demands that two examiners shall visit each patient for the purpose of commitment. Yet but a score or two of these ever visit the state hospital and keep abreast of their patients' condition and treatment.

County medical societies should cooperate with the mental hygiene committee in encouraging the establishment of psychopathic wards in connection with general medical hospitals in cities and large towns, where cases of alleged insanity may be cared for pending commitment, where well-oriented voluntary cases may receive initial and temporary treatment; and where decent and adequate hospital accommodation may be substituted for the jail and the lock-up.

The responsibility for the success or failure of the campaign for the prevention of insanity will lie at the door of the physicians of this state.

OCCUPATIONAL DISEASES OF THE EAR, NOSE, AND THROAT.*

By W. SOHIER BRYANT, A.M., M.D.,

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HOW wide-spread this subject is, will be plain to you when you consider the occupations which are accompanied by dust, the escape of poisonous gases into the air, the escape of poisonous particles with the dust, continuous loud sounds, explosions and detonations, rapid changes of temperature, rapid changes of humidity, rapid changes of barometric pressure, wetting of the surface of the body, entrance of water into the nose or external auditory canals, concussion of air in the external meatus, entrance of foreign bodies in the external auditory canal, blows about the head, entrance of pathogenic organisms, hydraulic pressure in external auditory canal or upper air tract, and abnormal high barometric pressure in upper air tract.

You see there are few occupations which do not in some particular, partake of the above deleterious conditions of occupation.

The enumeration and description of occupational diseases of the upper air tract is valuable, since a study of the subject points out the wide extent to which these diseases prevail. Such a study should direct the public to the necessity of protecting itself from injury from many occupations. This investigation will also collect data and observations which should result in the miti-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

gation of unsanitary and harmful conditions. The effect of general ignorance is shown in a striking manner in the backwardness of public opinion and consequently in legislation, but most unmistakably in the lack of interest in the enforcement of protective laws which are even now on the statute books. For instance, the unnecessary accumulation of city dust, and, most important of all, the air contamination of cities are most important factors. We refer to the contamination of the air by the poisonous gases resulting from coal combustion. Chief of these poisonous gases are sulphur dioxide, the most destructive of all, and carbon monoxide.

GENERAL ASPECTS.

It is very difficult to draw the line between accidental and occupational diseases, and still more difficult to draw the line between habit and occupational diseases. We classify all diseases as *occupational*, which attack a worker in the course of his vocation, whether they arise directly from the nature of the occupation (as for example, boiler-maker's deafness from boiler-making), or whether they arise from an accidental occurrence of a nature dependent upon the kind of employment, such as in powder-makers, the rupture of the drum membrane from an accidental explosion.

The distinction between habit and occupational diseases, so intimately are they blended, is one most difficult to make. Of course some diseases are easily designated as habit and others as occupational. For instance, a smoker's rhinopharyngitis is readily classed under habit diseases. But should the catarrhs found in all city dwellers, be classed under habit or occupational diseases? We should class them under occupational diseases.

The etiological factors in occupational diseases, classified according to their importance, are:

1. Gaseous impurities of respired air.
2. Dust impurities of respired air (mechanical, chemical).
3. Hydrometric irregularities of inspired air.
4. Temperature (thermal) irregularities of respired air.
5. Noises.
6. Misuse of the voice, general, local (exhaustion).
7. Foreign bodies larger than dust particles.
8. Mechanical trauma.
9. Barometric irregularities of respired air.
10. Explosives.
11. Nervous disturbances (mental).
12. Hydrostatic pressure.
13. Percolation of water.

From a pathological standpoint, a classification of the occupational diseases of the upper air tract and ears in the order of their importance can be made as follows:

1. Toxic.
2. Infectious.

3. Irritant (mechanical, functional, aqueous, thermal).
4. Exhaustion, local, general.
5. Lesion of continuity.
6. Commotion.
7. Foreign bodies (occlusion).

The following is a list of occupations, harmful to the ear, nose, and throat, and their chief insidious factors:

1. City occupations. In all city occupations, we have to contend with poisonous combustion gases and dust.

2. Dwelling houses. Over-heated in winter, occupants suffer from high temperature, deficient humidity, etc.

3. Boiler-makers are apt to have injuries of the cochlear sound perceiving apparatus through exposure to continued loud sounds. They also are exposed to dust, which acts as an irritant to the upper air tract.

4. Machinists usually are exposed to continuous loud noise and dust.

5. Blacksmiths are exposed to dust, heat, and the poisonous gases of combustion, and noise.

6. Barrel-makers' ears are often affected by the loud noise.

7. Millers are exposed to continuous noise, which injures their ears and to too much dust, which injures the upper air tract. The dust also clogs the external auditory canals.

8. Engineers, through exposure to heat, changes of temperature and long continued noise, often suffer from impaired hearing.

9. Factory-workers of all kinds suffer from dust coming from some parts of the manufacturing process and consequently suffer from irritation of the upper air tract.

10. Mill-workers of all kinds have too much dust in some parts of the manufacturing process and suffer from irritation of the upper air tract.

11. Railroad employees suffer from deterioration of hearing resulting from noise and exposure to bad weather.

12. Engine drivers suffer more than other railroad employees from deafness due to noise and exposure to bad weather.

13. Grocers are exposed to dust which irritates the upper air tract.

14. Stone-workers and stone-cutters. Dust irritates the upper air tract and stuffs the external auditory meati.

15. Miners. Dust, combustion gases, dampness and working in unnatural positions, disturb the equilibrational mechanism and cause miners' nystagmus, or disturbance of vestibular apparatus. Miners also have irritation of upper air tract.

16. Agricultural laborers are exposed to rough weather and irritating dusts.

17. Tobacco manufacturers suffer from irritation of the upper air tract from the tobacco dust.

18. Tobacco gatherers and handlers suffer from irritation of the upper air tract.

19. Mustard manufacturers also suffer from irritating dust.

20. Workers in vinegar factories suffer from irritating acid fumes.

21. Coffee roasters. Irritating fumes and dust.

22. Workers in chicory factories. Irritating dust.

23. Vanilla handlers have irritation of upper air tract.

24. Gunpowder workers are affected by the dust of the powder mills and the frequent explosions injure their ears.

25. Makers of other explosives are exposed to fumes of nitric acid and other acids, to irritating dust and to explosions, damaging the ears.

26. Sugar refiners are exposed to dust, irritating gases, clogging of the skin of the ears by the syrup and to changes of temperature.

27. Starch and glucose manufacturers suffer from maceration fumes, sulphuric acid, and dust.

28. Preserve manufacturers and canners are exposed to irritating acid fumes and lead dust.

29. Workers in alcohol factories are affected by irritating fumes from fermentation, dampness and steam.

30. Brewers suffer from fermentation vapors, dust, dampness, and changes in temperature, all of which contribute to ear, nose and throat diseases.

31. Chemical workers are exposed to poisonous and irritating gases and dusts.

32. Match makers are exposed to poisonous gases, to poisoning by phosphorous and to irritating dusts.

33. Workers in poligraphic trades are exposed to dust and also to lead poisoning of the upper air passage.

34. Cooks are exposed to radiant heat and to rapid changes of temperature, which cause inflammations of the upper air tract.

35. Stokers are exposed to great heat and to rapid changes of temperature and dust.

36. Confectioners suffer from heat and changes of temperature.

37. Bakers suffer from high and rapid changes of temperature, combustion gases and dust.

38. Nurses are exposed to the inspiration of pathogenic bacteria and to inflammation of upper air tract.

39. Coachmen, and

41. Shepherds, and

42. Cowboys, are exposed to dampness and cold and also to contagion from the animals they attend, especially glanders, and injury of the ears and nose from kicks.

43. Tanners are exposed to irritating dust from the skins and to the contagion from the skins, such as, for example, actinomycosis.

44. Furriers are exposed to irritating dust, and to infection from furs.

45. Hat makers are exposed to irritating dust.

46. Members of the professions are often affected by over brain work. Exhaustion from the emotions weakens the vasomotor and trophic nerves of the upper air tract and irritation of the mucosa follows.

47. Glass-blowers sometimes distend Steno's duct and are exposed to contagion from their fellow workers by the common use of blowpipes.

48. Soldiers are exposed to rough weather, injury from explosions and detonations, and to blows on the external ear.

49. Sailors are exposed to rough weather and to injury from explosions and detonations. They are also exposed to injury of the ears from water in the external canal or Eustachian tube in bathing and diving.

50. Hunters and marksmen are injured by exposure of the ears to explosions and detonations. The upper air tract is also irritated by exposure to rough weather.

51. Fishermen and fish packers suffer from cold and wet.

52. Firemen suffer from cold and wet, from combustion gases and great heat, and from rapid changes of temperature and moisture.

53. Divers, bathers and swimmers. The ears may be injured by water in the external canal, causing irritation, by entrance of infected material through Eustachian tube and by rupture of drum membrane by great pressure.

54. Cold storage workers suffer from rapid changes in humidity and temperature and from escaping ammonia gas, all of which irritate the upper air tract.

55. Artificial ice makers suffer from rapid changes in humidity and temperature and from escape of ammonia gas.

56. Boxing. The external ears are sometimes contused, and the nasal cartilage dislocated or bones broken.

57. Athletic sports, bicyclists; etc. The vasomotors of the upper air tract, owing to general exhaustion, are unable to regulate the upper air tract, which consequently becomes irritated.

58. Hawkers, public speakers, singers, suffer from over-use and misuse of the voice, causing local irritation.

59. Caisson workers. The upper air tract with the accessory nasal sinuses and ears are irritated by the too rapid changes of barometric pressure, and also by the too rapid changes of temperature and moisture and the supply of pathogenic organisms, which readily take hold of the irritated mucous membrane. The tympanic membrane may be ruptured by too rapid alterations of barometric pressure.

60. Aeronauts are exposed to too rapid changes in barometric pressure which injures the ears and irritates the mucosa of the upper air tract. They are also exposed to too rapid changes of temperature.

CONCLUSION.

How can the wide-spread harm done by vitiated air, by poisonous gases and dust, be mitigated? The injury done by vitiated air is not so startling as diseases from other sources, because it acts slowly, insidiously.

However, the great destructive force of the occupational diseases of the ear, nose, and throat is appreciated when the number of those affected is considered. The preventive measures are to be sought by arousing public opinion to these evils and to their extended and vital importance. The danger in the case of every occupation should be recognized by law and should be minimized by law. When the public is sufficiently educated to appreciate the loss through these remediable hardships, it will not be slow in demanding salutary legislation, and in punishing by legal penalty and public opprobrium. The special means of protection in every instance are very obvious.

THE WATER-TRAP STOMACH, DIAGNOSIS, SYMPTOMATOLOGY AND TREATMENT.*

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and

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IT IS only at the present time that operations for fixation of ptosed and misplaced portions of the gastrointestinal tract are being reported as successful. This is due, undoubtedly to improved technique in gastrointestinal diagnosis, for which we have to be most grateful to the Roentgen ray. Imperfect diagnosis prior to operation, has been responsible for previous failures. There ought to be fewer cases of "exploratory laparotomy" for diagnosis in gastrointestinal troubles. Laparotomy is of necessity performed with the subject in the recumbent position, so that the surgeon cannot know the situation of the gastrointestinal tract in the normal, that is, in the usual standing position. For this reason, it is very necessary to have a detailed study of these organs with the patient upright.

In looking up literature on the subject, we found only two men who have reported results of operative work in fixation of the gastrointestinal tract, in any large number of cases, namely, H. D. Beyea¹ and T. Rovsing.² The former has reported 31 cases of gastropotosis, successfully operated upon, and the latter, 75 cases. According to Beyea, 44 such cases have been reported by others, Duret³ in 1896, Davis⁴ in 1897, Bier⁵

in 1900, Hartmann⁶ in 1899, Coffey⁷ in 1902, Gelpke⁸ in 1906, Eve⁹ in 1907 and La Place¹⁰ in 1908.

It is not intended by the authors of this paper to convey the idea that all the conditions hereafter described necessitate operation. In certain cases, indications are strong for immediate operation, but in most, medical treatment for a while is advisable and surgical later. In a very large number, medical treatment alone is sufficient.

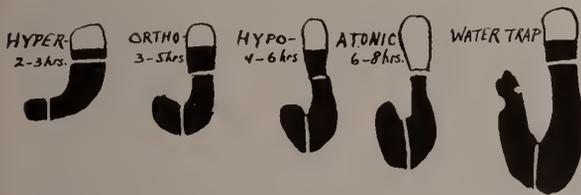
The "water-trap stomach," so named from studies in the X-ray laboratory, by means of the bismuth X-ray test, is a condition that shows definite clinical features. The radiographs are taken with the patient standing, after the ingestion of a full meal of 500 c. c. of fermented milk and 75 grams of bismuth subcarbonate. The shadow of the pylorus is considerably higher than the lesser curvature of the stomach and about the level of the second lumbar vertebra. The shadow of the greater curvature is at least three inches below the upper border of the umbilicus. The resultant figure is that of a long loop, which, taken with the shadow of the first and second portions of the duodenum, resembles the ordinary siphon water trap. This shape stomach can not, at times, properly empty itself on account of the long pyloric arm and may give a chronic congestion of the local venous circulation and consequently attacks of acute gastritis. The symptoms that accompany this condition are indefinite indigestion, loss of appetite, pain and tenderness over the epigastrium, progressive loss of weight, emaciation, and in severe cases, periodic attacks of vomiting. Neurasthenia and marked irritability are prominent symptoms in all cases, so far studied.

The etiology is as yet obscure. It may be of embryological origin, the stomach having a long mesogastrium with a resulting sagging of the most dependent portion; or it may be a mechanical result of a ptosed colon with a dragging down of the organ through the gastrocolic omentum. In all our cases, so far, a co-existing coloptosis has been found.

The pathology of this condition has been based on the results of observations in the X-ray laboratory on seemingly normal stomachs, on ptosed stomachs, on 11 cases of the water-trap type, and by observation of four water-trap stomachs which were operated upon. We have been much aided by observations on the cadaver, made by ourselves and by Dr. H. J. Prentiss of the Iowa State University and Dr. H. D. Senior of the University and Bellevue Hospital Medical College. The stomach has two fixed points, the cardiac end, held in place by the esophagus; and the pyloric extremity, held by the duodenum, which in turn is fixed by the duodeno-hepatic ligament and the retroperitoneal tissue which binds the duodenum to the spine. This point of fixation is usually constant unless there is a

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16th, 1912.

marked ptosis of all the abdominal viscera. The pylorus in our cases is at about the normal level and not stenosed. The greater curvature of the stomach in the severest case reached well into the pelvis and seven inches below the umbilicus. The accompanying drag upon the pyloric extremity showed in the first two operative cases, marked congestion of the veins of the stomach. This must have been caused by the pressure or tension upon the veins as they leave the organ in the region of the pylorus. The stomachs in the operative cases showed marked but not excessive dilatation. In cases of simple ptosed stomach, the drag upon the pylorus is not present, and the pyloric arm is short, so that the organ can empty itself properly at all times. The emptying of the water-trap stomach is slow but not excessively so and none of the cases at first observed show the marked residual type although we could see no reason why it should not occur. Later we found several. This form of stomach must not be confused with the hypotonic, orthotonic, hypertonic, or atonic stomach of Schlesinger, comparative diagrams of which are appended.



Diagrammatic representation of four types of stomach found in individuals who may present no gastric symptoms—hypertonic, orthotonic, hypotonic and atonic (after Schlesinger).¹¹ The fifth type is the water-trap (Satterlee and Le Wald), which in its action may resemble any one of the first four types. The figures represent the emptying time of the first four types (R. S. Lavenson).¹²

The fifth type in the diagram is the water-trap, which in its action may be hypertonic, orthotonic, hypotonic or atonic. The tendency for these stomachs, however, would be to become atonic.

In making a diagnosis, we must distinguish this type of stomach from several other similar clinical conditions. In the simple ptosed stomach, there is frequently a lack of stomach symptoms, unless they are indirectly due to a ptosis of the intestine and the usual accompanying constipation. Constipation does not necessarily accompany the water-trap type of stomach. In the water-trap stomach of a severe grade, we have as yet failed to see one that did not give serious symptoms. The radiograph shows the difference in the height of the pylorus, which is low in the ptosed stomach and high in the water-trap.

The simple dilated stomach often gives the history of ingestion of large amounts of food and drink and of vomiting quantities of undigested food sometime after eating, while in the water-trap stomach, vomiting occurs shortly after eat-

ing and may be very acute for hours or days. The radiograph will probably clear up the diagnosis although the types may resemble each other.

In a "residual" stomach of the non-water-trap type, vomiting occurs six to eight hours after a meal and often during the night. Early vomiting after eating and the radiographs will clear up the diagnosis. In the severe cases of water-trap stomach, the loss of weight is more rapid and progressive. The "residual" stomach may occur in the water-trap type.

Ulcer of the stomach, which often resembles the residual type of stomach, can be distinguished by the attacks of pain after eating, by the points of tenderness and persistent blood in the gastric contents and feces. Blood has appeared in the vomitus during the acute attacks of gastritis in the water-trap type of stomach.

Periodic attacks of vomiting in young people with progressive neurasthenia and emaciation point strongly to this type of stomach.

The treatment of patients with the water-trap stomach can be subdivided into that for (a) mild and for (b) severe cases. In mild cases, the treatment is chiefly for a ptosed sluggish colon and the accompanying autointoxication. An abdominal belt with a colon pad is essential. After meals, the patient should lie down in the Goldthwaite position, that is on the right side so as to allow the stomach to empty properly, with the hips elevated and the head low. At night, the foot of the bed should be elevated four to six inches in order that advantage of the position during the night's rest may be taken. A soft diet without meat may be necessary and constipation should be corrected without the use of drugs. Flatulence may be helped by abdominal massage and colon vibration. Fermented milk, pure cultures of lactic acid bacilli and sometimes dilute hydrochloric acid are needed.

Retention of feces in the pelvic colon (which is demonstrated by the X-ray findings) should be relieved by colon irrigations. Colon irrigations, however, should not be given as a routine unless there is some good indication for it. It is very important to feed these patients and to make them gain weight; this is sometimes accomplished by rest in bed and gradual forced feeding, beginning with infant foods, such as malt soup, beef juice, the albumen of a dozen or more eggs per day, cereals and jellies with the object of building up and strengthening the intestinal mesenteries and walls. If after a few months treatment, the patient shows absolutely no improvement, surgical procedures are indicated.

In regard to the literature on the subject of operative procedures, Beyea¹ describes four methods of technique. (a) Gastropexy or parietal fixation of the stomach; (b) elevation of the stomach and transverse colon, through suture of the great omentum at a point one inch below the umbilicus. This is the hammock operation of

Coffey.⁷ (c) Replacement of the stomach, through suture of the gastrocolic omentum to the anterior abdominal wall, plus the shortening of the gastrohepatic ligament (Eve⁹ and La Place¹⁰). (d) Elevation of the stomach to the liver at the transverse fissure by suture of the gastrohepatic ligament. Beyea claims to have originated this operation.

Gastroenterostomy does not seem to us to be the operation of choice. In the hands of some surgeons, it has given excellent results for drainage of the stomach, but it is the severer operation and hardly seems advisable unless there is an obstruction at the pylorus which cannot be relieved in any other way.

The treatment for the severe cases, which includes the mild ones that have resisted prolonged medical care, is surgical. In two of the cases presented, gastropexy and colopexy were done with excellent results. After scarification of the peritoneum on the anterior wall of the stomach and of the parietal peritoneum, the stomach was united to the abdominal parietes, just above the umbilicus. The colon was suspended by a row of sutures through the gastrocolic omentum, about half an inch from the colonic attachment, to the abdominal wall, just beneath the stomach. The results in these two cases have been excellent so far. The operations were performed in case II eight months ago, and the patient has gained 16 pounds, has no stomach symptoms and has practically recovered from severe hysteria and neurasthenia. In case III, the patient was operated upon six months ago, has gained 10 pounds and has no stomach symptoms, but is still constipated and not completely recovered from her hysteria. Dr. B. J. Lee's two patients (cases V and VI) upon whom he operated after the method of Coffey's hammock operation, have been doing well. It is only a short time, two months, since the operation, but the patients have gained ten pounds each and completely recovered from their gastric symptoms.

CASE I.—D. F., male; age 32 years; jeweler. Patient does not remember having had any diseases. Habits are regular. For two years patient has not been feeling well. Has headaches occasionally and thinks has lost weight. Appetite fair but varies, and has a bad taste in the mouth. Has no vomiting nor flatulence, legs feel weak and is constipated. Physical examination shows a somewhat emaciated individual. The gastric analysis is about normal. The bismuth X-ray examination of the gastrointestinal tract shows a slightly ptosed water-trap stomach, emptying in a sluggish manner and a slightly ptosed colon. The treatment has been an abdominal web belt, intestinal hygiene, exercise and fresh air.

CASE II.—Mrs. E., age 31. Five years ago, weighed 160 pounds; one year ago, 135; now weighs 102 pounds, a total loss of 58 pounds in 5 years, and 33 pounds in one year. She has had attacks of vomiting for the past year, averaging every two weeks. They begin with loss of appetite, vertigo, flatulence and then vomits everything eaten. Between attacks has felt fairly well, but had a gradual emaciation with no response to medical treatment. Emaciation was very marked. The stomach

percussed large and low. Test meals and lavage were impossible on account of patient's severe nervous condition. The urine was normal and the blood showed a moderate anemia. On July 22d, the patient had a severe vomiting attack which lasted two days, necessitating rectal feeding. Radiographs showed a long looped water-trap stomach with the pylorus fairly high. The greater curvature is six inches below the umbilicus. The emptying was a little slow, five hours. There was a moderately long and ptosed colon, empty only after four days. The patient was placed in bed, in the Goldthwaite position, the feet and thighs elevated. This was followed by a very severe attack of vomiting, lasting two days and leaving her very feeble. At times she vomited blood and was regarded by all who saw her as in a critical condition. Hysteria was marked during and after both these attacks of vomiting.

Operation was performed by Dr. John Douglas on August 12th at St. Luke's Hospital. A median incision was made and the exposed stomach found to be very low, the lesser curvature being below the umbilicus and also below the pancreas, but the pylorus was near the normal position, the shape of the organ, resembling, as in the radiographs, that of a water-trap. The veins of the stomach were markedly congested. The liver flattened, the lower border low, the kidneys were in their normal position. The colon was low in the pelvis. As the gastro-hepatic omentum seemed too thin to suture, the ventral surface of the stomach was fastened to the peritoneum of the anterior abdominal wall by two chromic gut sutures, at the level of the umbilicus. The gastrocolic omentum, close to its attachment to the transverse colon was also sutured to the parietal peritoneum just below the greater curvature of the stomach. This latter was done with the idea of giving additional support to the stomach.

The patient made a good recovery. An abdominal web belt with two colon pads has been worn and the foot of the bed elevated six inches from the floor. Improvement has been steady with slight gastro-intestinal disturbances, such as diarrhoea, occasional but of short duration. The insomnia and nervousness have gradually disappeared and general appearance is good. Seven months after operation had gained 16 pounds. Appetite good and she is gradually returning to a normal diet and is considered cured.

CASE III.—Miss E. B., 22 years of age; sales clerk. For the past five years, especially in the winter time, has had sensations of a "lump-like feeling" in the epigastrium with a choking sensation relieved only by eructations. Had great fear of eating but no vomiting. Bowels regular. Has had progressive weakness and lost eighteen pounds in this time. Hysterical attacks nearly every day, extremely emaciated, nervous and hysterical. Tenderness over the entire epigastrium marked. The gastric contents were normal. The stools were normal and the urine showed a trace of indican, otherwise normal. Radiographs showed a stomach of the "water-trap" type, very long, greater curvature 5 inches below umbilicus and empty in seven hours. Colon, long, ptosed, and showed a good early motility. Complete motility not obtained on account of the patient's extreme nervous and hysterical condition. The cecum ptosed and dilated. What appeared to be a pylorospasm was present. This was shown afterwards at the operation to be caused probably by the cicatrix of an old ulcer in the duodenum near the pylorus. Operation, October, 1911, by Dr. C. C. Sichel. The abdomen was opened through a median incision and exposed a long trap-shaped stomach, with the pylorus in about its normal position. The veins of the stomach were markedly congested. On the anterior wall of the first portion of the duodenum was found a small scar, probably the result of an old ulcer. The anterior wall of the stomach was sutured to the parietal peritoneum just above the level of the umbilicus. The gastrocolic omentum was then fastened to the abdom-

inal wall just beneath the greater curvature, forming an additional support to that organ.

Gastric symptoms of the patient cleared up rapidly after the operation but the bowels are slightly constipated. Has worn an abdominal belt with colon pads.

In 7 months has gained 10 pounds, feels and looks much better although she has had two very severe attacks of hysteria. No stomach symptoms but bowels are constipated. Radiographs show the stomach and colon well up in place, the former 3 inches higher and has lost the water-trap shape.

CASE IV.—Mrs. H. C., 31 years old. For ten years the patient has complained of "bloating with gas" following a very difficult labor with a full term large child and forceps delivery. She was in bed three weeks after childbirth, and this together with the severe labor might account for the relaxed condition of the abdominal walls and the somewhat ptosed condition of the viscera. Lost 14 pounds. Had obstinate constipation, insomnia, marked neurasthenia and a moderate anemia with occasional vomiting. Radiographs showed a long vertical stomach slightly water-trap in type. Exact emptying time was not observed but there was no retention at the end of seven hours. The large intestine was high, type transverse, early motility, slow, and complete emptying time 2 days with stasis in the sigmoid flexure. Large quantity of gas in the splenic flexure and less in the hepatic. At the end of 48 hours the sigmoid flexure had not emptied itself. Physical examination showed a frail slender individual with extremely flabby abdominal muscles, the recti muscles showed no resistance whatever.

Patient was put in bed. Diet carefully regulated so as to cause the least amount of abdominal distress and with the highest caloric value possible under the circumstances. She was also instructed to lie on the right side for three-quarters of an hour after meals, so as to facilitate the emptying of the stomach. For a month no vomiting occurred and nervousness became less but the flatulence did not improve much. Colon irrigations, massage and vibration over the colon was practiced every day.

CASE V.—Mrs. S., age 32. (Patient of Dr. B. J. Lee). Neurasthenic type. Has had several attacks of appendicitis with acute pain in the lower right iliac region for over three years. Has had epigastric distress but little nausea and vomiting and has lost considerable weight. The radiographs showed a stomach of the vertical water-trap type, the greater curvature $5\frac{1}{2}$ inches below the umbilicus and not empty until eight hours after the ingestion of the test meal. The colon sluggish and ptosed. Operation was performed on February 16, 1912. The stomach was found low and of the water trap type. The veins were not dilated. The cecum was not unduly enlarged and the appendix showed a state of chronic inflammation with a few adhesions. Appendectomy was done and then the hammock operation of Coffey, suspending the colon and with it the stomach.

April 13th.—Has made a good recovery and has gained 10 pounds and no abdominal discomfort or pain nor indigestion. Bowels are regular.

CASE VI.—Mrs. C. H., age 20 (patient of Dr. B. J. Lee). Six years ago, appendix was removed. Had two attacks of colitis with fever. Present illness began with colitis last summer. Since then has complained of distress in the lower abdomen on both sides. She was an anemic and frail individual. Some tenderness over lower half of abdomen. Radiographs showed a water-trap stomach, greater curvature 6 inches below umbilicus, length of the organ 12 inches. After 8 hours, stomach was not empty, estimated emptying time 10 hours. Colon long and ptosed, early motility good, completely empty in 4 days. Cecum dilated and ptosed. Operation, February 28th, by Dr. Lee. The cecum found

low, very large and freely movable, lying against the pelvic brim. The cecum was plicated in longitudinal folds, resulting in much more fixed and nearly normal sized organ. Second incision in the median line of epigastrium showed large water-trap type stomach, its blood vessels not unusually dilated. The hammock operation of Coffey was performed.

April 10th.—Condition good with no abdominal distress. Bowels move well but still takes small amounts of cascara. There is a small amount of thickening in the cecum but no tenderness.

CASE VII.—Miss M. W., age 34, nurse (patient of Dr. H. S. Satterlee). Has had nervous indigestion off and on all her life. The bowels previous to this trouble, fairly regular. The present trouble began with her work as nurse in the health department, when she began to have indigestion, constipation and what she called chronic ptomaine poisoning. Had cold sweats, twitchings and suffered from autointoxication and had green stools. Has had pain in the epigastrium at night, flatulence and gurgling in the bowels about 4 A. M. On only one instance did she have vomiting, which was attributed to a ptomaine poisoning. Normal weight, one and a half years ago was 110 pounds, is now 95. The urine has contained indican, which varied in amount, proportionately with her feelings and intestinal condition. Radiographs showed marked water-trap stomach, pylorus in the normal position, greater curvature, $5\frac{1}{4}$ inches below upper border of the umbilicus. The shadow of the stomach measured $3\frac{3}{8}$ inches by 11 inches. Colon long and ptosed. Has improved some under medical treatment and benefited by taking lactic acid bacilli cultures. Her present condition is about stationary so that operative procedures are under consideration.

CASE VIII.—M. J., child's nurse, age 19 (patient of Dr. George B. Wallace). Following the grip one year ago, has had trouble with her stomach. Has had marked flatulence with eructations and abdomen has been swollen and painful. Bowels have been very constipated and has had pain in the region of the ensiform. The clinical diagnosis was gastrocoloptosis with constipation and intestinal toxemia. Radiographs showed a water-trap stomach with the greater curvature 3 inches below the umbilicus. Stomach was $10\frac{1}{2}$ inches long and empty in about $3\frac{1}{2}$ hours. Appendix was well outlined extending to the left of cecum, tip curling to the right in pelvis. Colon was long, ptosed and empty in three days. The cecum and ascending colon retained bismuth longer than the other parts of large intestine.

Possibility of an appendicitis suggests itself on account of the well marked bend in that organ. Treatment has been unsatisfactory but an abdominal belt has been advised with diet and laxatives until the patient can come under closer observation.

CASE IX.—Mrs. D. L. L., age 37 (patient of Dr. F. Beekman). Normal weight is 120 pounds. No history of gastrointestinal trouble in her family. Present illness began with an attack of dysentery 3 years ago. Has had an alternating diarrhoea and constipation, mucus and blood in the stools at times. Has complained much of flatulence and pain especially in the region of the cecum. Appetite has been fair, there has been no vomiting. Urine has contained a faint trace of albumen but no indican. There is a moderate anemia. Radiographs showed a well marked water-trap stomach with highest portion of the duodenum $2\frac{1}{4}$ inches above umbilicus and greater curvature 5 inches below umbilicus. At seven hours there was still some food remaining in the stomach. Colon ptosed and slightly sluggish. Cecum markedly ptosed reaching the median line on a level with symphysis pubis. Treatment has been a regular diet with plenty of green vegetables, massage 3 times a week, agar agar, malt and codliver oil. April 8th, 1912.—Has gained 10 lbs.

and blood nearly normal. Feels well, bowels regular, stools normal and sleeps well.

CASE X.—Miss E. McG., age 22, (patient of Dr. S. A. Brown). Has had pain in abdomen and "indigestion" for years. Was operated in May, 1903, for appendicitis. For three months after that appeared to be better but began to have pain in stomach and vomiting following slight indiscretions in diet. Was unable to eat anything without vomiting and had a very bad taste in

the mouth. Had lost weight and much emaciated. The patient was referred for bismuth X-ray test with the probable diagnosis of ulcer of stomach. Radiographs showed stomach of marked water-trap type, greater curvature, 7 inches below umbilicus, size, 3¼ by 12 inches. The most marked thing about her case was that at the end of six hours, the bismuth meal was nearly all packed in the most dependent part of the stomach, scarcely any having passed over into small intestine. Complete emptying time could be only esti-



FIG. 1.—Water-trap Stomach. Case IX. Distance from greater curvature to highest point of duodenum, 7 inches.

mated at about 9 hours. Large intestine was long, ptosed and completely empty at the end of 24 hours. Treatment has been medical, lavage and diet with marked improvement and slight relapses.

CASE XI.—Miss S. R., age 31, (patient of Dr. R. J. Carlisle and Dr. G. D. Stewart). Twelve years ago, patient had an operation for abscess in pelvic region and right ovary and tube were removed. For past 15 months has had pain across lumbar region and irregularity of bowels. Passes considerable mucus at times and complains of a "raw feeling" in the bowels after stools. There has been no vomiting. Radiographs showed a stomach of the water-trap type, the greater curvature $5\frac{1}{2}$ inches below umbilicus. A complete control set of radiographs was taken. Stomach was 12 inches long, not empty until an estimated six hours. Colon was very long, ptosed, early mobility slow. In the first series, the colon was completely empty in 24 hours, while in the second series it was not free from bismuth until the end of three days. This showed the irregularity of the bowels as in history. It is also to be noted that at the end of four hours, the larger part of the bismuth meal was packed in lower part of the stomach with very little passed over into the intestine. Operation has been advised but as yet not performed.

The accompanying chart demonstrates the routine of complete examination of the gastrointestinal tract in the eleven cases quoted.

These represent about ten per cent. of all our cases which have been completely radiographed. We wish to thank the doctors who have contributed their cases or aided this work.

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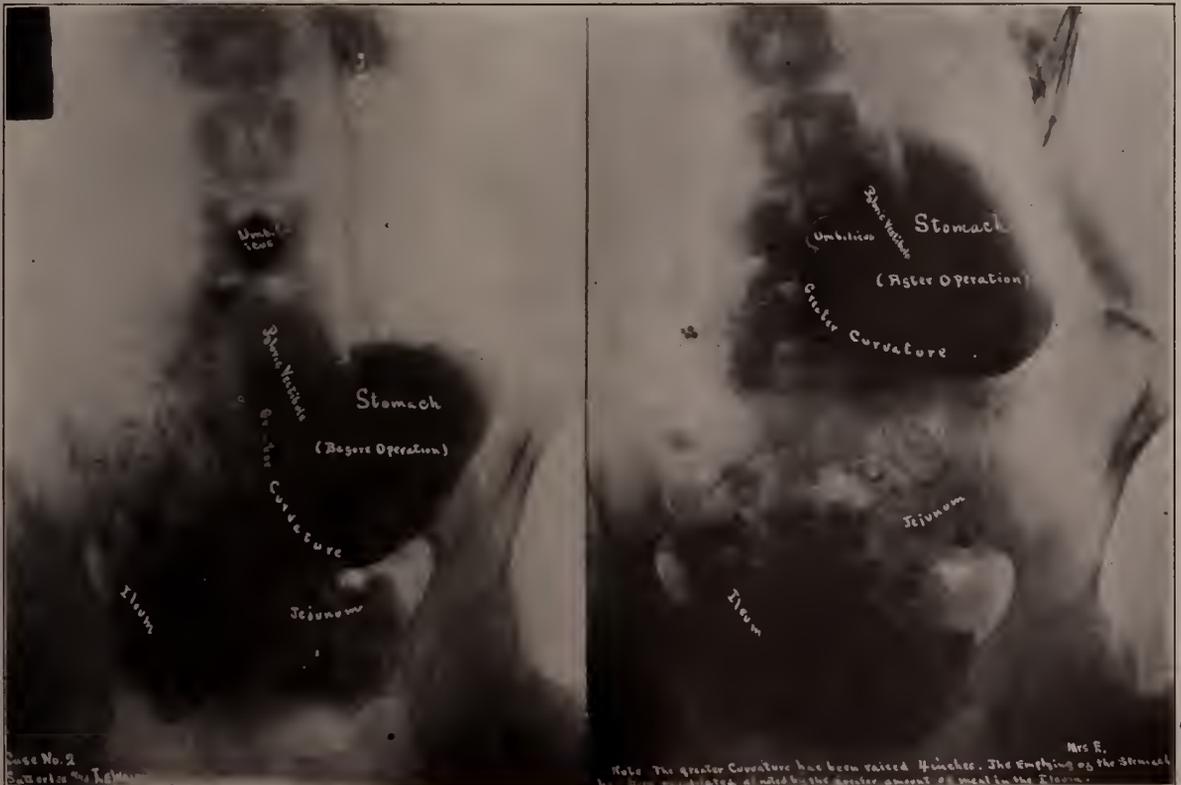


FIG. 2.—To the left is the radiograph of the stomach in case No. 1 before operation and 2 hrs. 35 min. after last meal. To the right is the same stomach after operation; the greater curvature is now 4 inches higher up.

Case	Primary Diagnosis	Chief Symptoms	X-RAY FINDINGS—STOMACH				INTESTINE			Appendix	LARGE	
			Position	Type	Size Inches	Hours Empty	Hours T. to Cl.	Empty	Position		Length	Position
D. F.	1 Constipation, neurasthenia	Constipation Bad taste	Greater curvature 1½" below umbilicus	Vertical slight water trap	3" x 10"	3	5—	—	Low	—	+	Ptosed
Mrs. E.	2 Dilated, ptosed stomach. Attacks acute gastritis neurasthenia	Emaciation Vomiting at attacks neurasthenia	6" below umbilicus	Vertical marked water trap	3" x 11¾"	5	4	6	Ptosed	—	++	Ptosed
(b)	3 After operation	.....	3¼" below umbilicus	Slightly oblique	3" x 9"	5	3	6	Slightly higher	—	++	N
E. B.	3 (a) Dilated, ptosed stomach Water trap? Neurasthenia Hysteria	Emaciation Sensation of lump in throat Weakness Constipation	4¼" below umbilicus	Vertical water trap	3¼" x 12"	7+	3	—	Ptosed	—	+	Ptosed
(b)	3 After operation	Hysterical	1" below umbilicus	Vertical fish hook	3½" x 9½"	6 Est.	2 Est.	—	N	—	+	N
H. C.	4 Neurasthenia, slight constipation. Attacks of acute gastritis	Insomnia, vomiting, flatulence, constipation, loss of weight, neurasthenia	3" below umbilicus	Vertical slight water trap	3½" x 10½"	? No retention	—	—	—	—	N	High
Mrs. S.	5 Recurrent appendicitis	Attacks of pain in right iliac region, epigastric distress, loss of weight	5½" below umbilicus	Vertical water trap	3" x 12"	8+	2 (?)	—	N	—	+	Ptosed
C. H.	6 Colitis. Gastroptosis. Colopptosis.	Abdominal distress and tenderness, loss of weight	6" below umbilicus	Water trap	3" x 12"	10 Est.	N	—	Low	Removed	+	Ptosed
M. W.	7 Chronic appendicitis. Intestinal toxemia	Constipation, insomnia, flatulence, loss of weight	5¼" below umbilicus	Water trap	3½" x 11"	4¼	2	—	—	—	+	Ptosed
M. J.	8 Gastro-colopptosis	Flatulence, painful and swollen abdomen, constipation	3" below umbilicus	Water trap	3½" x 10"	3½ Est.	1½	—	N	Out-lined to left of cecum	+	Ptosed
D. L. L.	9 Colitis	Alternate diarrhoea and constipation, flatulence and pain near cecum, loss of weight	5¼" below umbilicus	Water trap (marked)	3¼" x 11½"	7+	N	N	—	—	++	Ptosed
E. McG.	10 Ulcer of stomach?	Vomiting after all food, emaciation	7" below umbilicus	Water trap	3¼" x 12"	9 Est.	6 obscured	—	—	Previously removed	++	Ptosed
S. R.	11 (a) Colitis	Pain lumbar region, irregular bowels, mucus stools	5½" below umbilicus	Water trap	2¼" x 11½"	6 Est.	3	—	—	—	++	Ptosed
(b)	11 Same for control	.....	5½" below umbilicus	Water trap	3½" x 12"	6 Est.	3+	—	—	—	++	Ptosed

INTESTINE

Early Mot.	Days to Empty	Type	Loops	Cecum	Sig-moid	Feces	Urine	Gastric Contents	Roentgen Ray Diagnosis	Final Diagnosis	Treatment	Remarks
-	3+	U	1	Ptosed sluggish	+	Moderate amount vegetable and muscle	N	Hcl. .109 T.A. .208	Slightly ptosed trap stomach; slightly ptosed and sluggish colon	Water trap stomach ptosed; sluggish colon; neurasthenia	Position — intestinal hygiene abdominal belt	Improved
N	4+	W	2	Low	+ Dilated slow	-	N	-	Water trap dilated stomach; Coloptosis	Water trap dilated stomach; ptosed sluggish colon	Gastropexy abdominal support; colon pads; position; diet	
N	1½	Transverse	Irregular	Low	+ Dilated	-	N	-	.....	.....	.....	Vomiting stopped; 16 lbs. gained; bowels—first loose, then regular; marked improvement
Good	-	U	1	Ptosed	-	-	N	Hcl. .130 T.A. .245	Water trap stomach; coloptosis; pylorospasm?	Water trap stomach; healed ulcer duodenum; neurasthenia; hysteria	Gastropexy colopexy abdominal support; hydrotherapy, etc., for neurasthenia and hysteria	Stomach symptoms disappeared; marked gain in weight; hysteria worse, then improvement
Good	-	U	1	Ptosed	-	-	-	-	Stomach and colon in normal position	.....	.....
Slightly slow	2	Transverse	-	Ptosed	-	-	N	-	Slight water trap stomach; stasis in sigmoid	Slight water trap stomach; slight constipation; neurasthenia	Bed, rest, feeding; position (right side after meals); colon massage and irrigations	Improved
-	3	U	1	N	N	-	-	-	Water trap stomach; ptosed sluggish colon	Chronic appendicitis; water trap stomach; ptosed sluggish colon	Operation—appendectomy; hammock suspension operation on colon and stomach	Two months after operation gained 10 lbs.; feels well; no discomfort
Good	4	U	1	Ptosed	-	-	-	-	Water trap stomach; ptosed and sluggish colon	Water trap stomach; ptosed and sluggish colon	Operation—hammock of Coffey	Two months after operation gained 10 lbs.; symptoms relieved
-	-	U	1	-	N	-	+ Ind.	-	Water trap stomach; ptosed colon	Intestinal toxemia; ptosed colon; water trap stomach	Medical—abdominal support; colon pad; lactic acid bacilli	Improvement; condition stationary
Rapid	3 est	U	1	Slow and Ptosed	-	-	-	-	Dilated, water trap stomach; ptosed and sluggish colon; appendicitis?	Ptosed and sluggish colon; water trap stomach; intestinal toxemia	Medical—abdominal support and colon pad; laxatives—(control difficult)	
Good	2	U	1 Long	Ptosed sluggish	N?	Mucus	-	-	Water trap stomach; ptosed colon; sluggish or ptosed cecum	Water trap stomach; ptosed colon; sluggish or ptosed cecum	Medical—regular diet; agar-agar. cod liver oil; massage to colon	Marked improvement; gained 10 lbs; stools normal
-	2	U	1	Ptosed	-	-	-	-	Water trap residual stomach; ptosed colon	Water trap and residual stomach; chronic gastritis	Medical, lavage and diet	Marked improvement
Slow	1	U	1	Ptosed ++	-	Mucus	-	-	Water trap stomach; ptosed and irregular emptying colon	Water trap stomach; colitis with ptosed and irregularly acting colon	Medical—case under observation for possible operation	
Slow	3	U	1	Ptosed ++	-	-	-	-				

ACUTE POLIOMYELITIS.*

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IN order to gain a clear cut idea of the clinical picture of any disease which presents a great variety of symptoms, some form of classification is essential.

The classification now most commonly used in acute poliomyelitis is that of Wickman. This for many reasons is undesirable. The chief objection to the classification is the fact that it is not based upon any one phase of the disease, but is a combination of its anatomical and symptomatic features. It has seemed better in the light of recent studies to adopt a simple anatomical division for those cases of acute poliomyelitis that develop paralysis and to add a third group, the unparalyzed or abortive cases. The anatomical division depends upon whether the lesion has affected the upper or the lower motor neurone. The former produces spastic symptoms and the latter flaccid paralysis. In discussion of the acute stage of the disease, however, where the clinical picture is the central point it is convenient to speak of four clinical types of the disease; first, the usual type, second, cases without prodromata beginning with paralysis, third, cases with remission of symptoms and delayed paralysis and finally, cases with deep stupor.

I. USUAL TYPE.

In the commonest form of the disease, the paralysis appears on the first or second day after onset. At this time the child may be found lying on its back, with thighs slightly flexed and everted in a frog-like manner, and the head usually rotated to one side. The eyes are partly or wholly closed and there is a peculiar tired, wilted expression. Not infrequently, the chin is pointed upward a little, indicating a small degree of retraction of the head. From this drowsy or almost sleepy condition, the child can be roused suddenly, often by the gentlest touch or manipulation of an extremity. Very frequently when the leg is lifted only a few inches from the bed an expression of annoyance, rather than distress, crosses the face, and if the leg be the paralyzed one, the child often tries to free it from the examiner's hands by twisting the trunk and shoulders. This procedure is a surprisingly common one and is usually accompanied by a pettish, fretful, rather bored look and whine. But when the examiner stands back from the bed, the patient lapses almost at once into the drowsy state. In antithesis to these cases are those of a more sthenic nature with evidently greater meningeal irritation. These children are almost always

found lying on the side with heads drawn well back and the knees and thighs flexed, a classical meningitis posture. Occasionally a true opisthotonos appears. One such case could not be made to lie on his back, evidently because the flat line of the mattress prevented the slight degree of opisthotonos which made him comfortable; but when a pillow was doubled up under the lower dorsal and lumbar region so that an opisthotonos was induced by gravity acting on hips and shoulders, the child went promptly to sleep in the dorsal position. Such cases are also apt to have the drowsy, wilted look. Much more rarely, the child is wide-eyed and has an anxious, apprehensive, rather frightened expression. Many times these patients do not wait to be touched before objecting, but cry out even when the nurse or doctor approaches the bed; and it is surprising how keenly the little patients seem to determine whether or not an approaching person is coming to perform some service which necessitates manipulation. In these cases one is amazed at the ingenuity with which the child, using what muscles he has, braces and turns and twists to escape painful positions. Indeed, in two most pathetic cases where both legs, both arms, back, anterior and posterior neck muscles were paralyzed, the hopeless attempt at defense was limited to wagging the head from side to side and feebly whining. In sharp contradistinction to these types are the few individuals who with limited or extensive paralysis do not seem to be at all sick.

The findings on physical examination naturally are composed chiefly of paralyzed muscles. There are, however, certain points connected with other organs which are helpful in diagnosis. Photophobia is not uncommon; there is rarely any involvement of the middle ear. In almost all of the cases the tonsils are large and congested and often ragged. Herpes labialis is rare. The superficial lymph nodes, however, are almost always palpable and not infrequently enlarged. It is, of course not justifiable to lay too much stress upon glandular enlargement in children. The finding has been very constant, however, and it is of interest that recent pathological studies have shown that a general adenopathy belongs to the disease. The lungs, except where a bronchopneumonia or localized edema resulting from paralysis of arterial walls occurs, show no abnormality. The heart seems never to be involved. The abdomen is likewise normal, save where a flaccid rectus or oblique muscle gives a doughy, inelastic feel to the belly wall. The liver and spleen show no clinical abnormalities. Rigidity of the neck is varied in degree, from sufficient stiffness to permit lifting the whole trunk by the head, to an almost normal flexibility. Most cases are markedly stiff, and occasionally rigidity and retraction of the head are as well developed as in the true meningitis. Further mention of the

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character of this rigidity will be made subsequently. The Kernig sign is likewise a variable quantity and its apparent presence depends, probably, on voluntary activities of a protective nature, rather than upon reflex spasm.

Those cases of acute poliomyelitis which have a fatal termination are always of these so-called usual type. They are the well-known ascending or Landry's form of the disease. The feature of interest of these terrible cases is that when uncomplicated by a broncho-pneumonia they are purely mechanical deaths. The patient suffocates from failure of the muscles of respiration. In every instance which we observed, the drowsiness which belongs so characteristically to the acute stage of the disease, disappeared as the first signs of respiratory involvement supervened. From the moment that difficulty in breathing began, the patient displayed an intensely alert state of mind. Evidently appreciative of the struggle ahead, the smallest child applied itself to the vital process of breathing, to the exclusion of every other form of muscular activity. Requests for assistance were monosyllabic and no motion was made of head or extremities. Indeed, the extraordinary alertness of mind and clarity of mental processes has been so striking in these cases that we have regarded it as a bad prognostic sign and were always glad to see a drowsy and stuporous child.

A curious thing is the unheralded advent of the paralysis. One may observe in the morning that a child moves its arms easily; a few hours later, on going to the bedside for some other purpose, the patient is found lying quietly as before, but when he rolls over, an arm falls back limp. The child seems unaware of the loss of power. In a few cases patients have complained of pain in an extremity shortly before paralysis supervened. While the presence of paralysis is easily detected in older children, it is sometimes most difficult to find in infants. In any case, the most satisfactory method of beginning a search for muscular weakness is to sit down by the bed and watch the child for many minutes. Of course, in some instances the patient lies a limp, inert form, the subtle expression of vitality gone. In such cases a glance is enough to determine the presence of paralysis and more careful examination is needed only to learn its extent. If the pain or tenderness is not too intense, gentle handling of the extremities soon discloses the muscle groups that still have some power left in them. Older children will usually move the arms or legs upon suggestions calculated to demonstrate faulty motion. Often, however, when there is great pain, it is hard to tell whether the children will not or cannot move. It then rests with the physician to decide whether the knowledge that a paralysis exists or not is worth the price of forcing the patient to move a painful member. With infants and children too young to comprehend, the only satisfactory way of finding paralysis is

by prodding with a sharp implement. The natural tendency to move a part which is being painfully disturbed away from the source of discomfort makes it obvious at what points to prod. Thus, if the deltoid be suspected of weakness, pricking the posterior and inner aspect of the arm causes an attempt at escape which involves raising the arms outward and upward. The extremity should be so placed at first that the suspected muscle will have to work against gravity; but it is surprising how quickly and skillfully the smallest infants twist and turn to make use of this natural force. Occasionally the presence of tone in a muscle can be shown by putting it suddenly on the stretch. For example, if the flexed forearm be sharply drawn down by the examiner toward extension, definite resistance will be noticed when the biceps is normal.

There is one group of cases in which it is almost impossible to locate definitely the paralysis. These patients present all the other features of the disease but no paralyzed muscles can be found. If such children be stood on their feet, however, they suddenly buckle at the hips and fall in a heap on the floor. Probably weakness of the gluteal muscles in some cases is accountable for this form; in others, weakness of the quadriceps.

Müller states that paralysis of the intrinsic back muscles is of frequent occurrence. This is a difficult palsy to demonstrate in the acute stage of the disease; for in the great majority of instances, the children will not or cannot sit up at this time. In some cases pain makes the patient antagonize the effort to sit up; in others there is apparently such general weakness of trunk and neck that the head drops and the spine bends like a reed. Yet in a week or two these children may be sitting up straight in bed and playing actively.

The superficial and deep reflexes have shown considerable variation, but on the whole, they have had a tendency to be present in the acute stage of the disease.

The appearance of a cutaneous eruption, which has been described as part of the disease, we have not seen. There have been several cases having more or less extensive erythematous rashes about neck and chest, but these have looked more like prickly heat than anything else and have had no constant distribution. Some of the children have been badly bitten by mosquitoes and many had pediculosis. Many cases have shown a pinkish purple mottling of the paralyzed extremities, but none of the extreme degrees of cold purple skin with edema that have been described. In one instance giant urticaria appeared, but there has been no example of zoster.

Sweating has not been a constant feature in the acute stage, but numerous cases showed localized areas which were continuously covered by perspiration. Thus one child's hands and feet

sweat profusely, but the arms and legs were dry. Several of the patients had sweating heads, in one case it was sharply limited to the left half of the face. A few of the children sweat generally and fairly profusely for a week or more. There was no constant relationship between sweating areas and paralyzed muscles. Several tests for sweating by local hot air baths failed to give any satisfactory results.

A few cases have had retention of urine so that catheterization was necessary. This condition never persisted more than a few days. In some instances, true retention did not occur, but there was difficulty in starting the stream. Hot appliances over the distended bladder, or placing the child on a chamber containing hot water usually sufficed to induce micturition. In one case with stupor there was incontinence.

Constipation has been the rule. In only one patient was there any indication of the loss of rectal control. This was in the case of an intelligent eight year old boy who, when constipated, had no difficulty, but who, when, as the result of catharsis, the stools were very loose, had involuntary movements on several occasions. Pain in some form is a constant feature of the acute stage of poliomyelitis. In general, three types are found: spontaneous pain, pain caused by manipulation, and tenderness of the muscles and nerve trunks to pressure. These are not all equally common. Pain caused by passive motion is most frequent and seems to depend primarily upon anterior flexion of the spine. The clearest demonstration of this fact occurs when a child's trunk is bent ventrally, shoulders toward hips, to throw the spinous processes apart in preparation for lumbar puncture. Such a procedure brings about immediately a marked degree of anterior spinal flexion and is strenuously objected to by the patient. The entrance of the needle is often unnoticed. There are several other manipulations, like the test for stiff neck and Kernig's sign which necessitates more or less bending of the spine anteriorly. The ingenious and active efforts of the children to thwart any motion which involves the least bending forward of the spine, or indeed diminishes a slight protective opisthotonos, have been very striking, so much so that we have been led to believe that the stiff neck of poliomyelitis differed from that of meningitis in being voluntary rather than reflex. With the Kernig's sign also, the voluntary element, where retained muscle power permits is even more definite. If flaccid paralysis of a lower extremity makes resistance impossible there is always complaint of pain when extension is carried until the buttocks begin to rotate forward and upward; but when the muscles have power to act resistance to hyperextension is quite definitely voluntary and has little the feeling of reflex spasm. This painful bending of the spine is also often responsible for the

unwillingness of children to begin sitting up in bed. The symptom occasionally persists for several weeks and, in these instances, is the only thing which keeps a happy, healthy looking child flat in bed. It is interesting to watch these patients on their backs, playing cheerfully and actively with arms and hands, suddenly look glum, apprehensive, and suspicious when a move is made toward them that may mean raising their shoulders and heads from the pillow. Often early improvement in the paralysis is masked by this painful symptom, or the fear of it.

Spontaneous pain sometimes occurs in poliomyelitis. This is much less frequent than pain on passive motion. Usually it follows the course of the nerves like a true neuritis. It may be very severe. Young children cannot definitely recognize limitation of pain to the course of a nerve and complain, therefore, of distress in the whole leg or foot. Such pain may perhaps be more often present than is generally supposed, for it frequently requires much urging and even sharp prodding to make a child move an extremity which seems to be paralyzed, when in reality the muscles have power but are painful. In some cases a child will cry out with pain which seems to come in stabs and paroxysms. The duration of pain of this sort varies like most of the symptoms of the disease. As a rule, it rarely lasts more than a week. In the case of one adult, the pain was so severe that morphine was necessary on several occasions. With young children we have used codeine. The third painful expression of acute poliomyelitis is the tenderness of muscle to pressure. Sometimes merely a touch suffices, but usually the muscle must be seized between the thumb and fingers and a little pressure made to produce pain. There is small doubt that this tenderness is in the muscles and is not a hyperæsthesia of the skin, for rubbing the skin without pressing on the underlying muscles, or even pinching, causes no painful sensations. A few cases also have definite tenderness over the nerve trunks like a neuritis. In one adult with complete flaccid paralysis of the right lower extremity, who had also great spontaneous pain, pressure over the anterior crural trunk caused intense suffering. Headache is rather more a symptom of the onset than of the acute stage.

2. CASES WITHOUT PRODROMATA IN WHICH PARALYSIS WAS THE FIRST SYMPTOM.

This type of case represents about 4.2 per cent. of the paralyzed cases. Except for the fact that there is no warning and that the paralysis is the first intimation of the disease, patients run a clinical course similar to those of the usual type. Their special significance of course, is the hopelessness of treatment for them. The checking of possible advance of the paralysis is all that can be hoped for.

3. CASES WITH REMISSION OF SYMPTOMS AND DELAYED PARALYSIS.

As in the prodromal period there sometimes occurs also a remission of symptoms in the acute stage of the disease. One occasionally sees a child that apparently improves and when hopes are high for its recovery, suddenly becomes worse again and further paralyzes develop. Apparently these cases are rare but they are definite types and should be recognized.

4. IN CASES OF DEEP STUPOR.

An important clinical type of the disease still remains to be considered about which a good deal of confusion in nomenclature exists. The term "cerebral" or "encephalitic" was applied by Strümpell, Wickman, Müller, and others to describe those few rare cases which have had spastic paralyzes, dependant upon upper motor neurone lesions. Recently, however, there has crept into the literature a confusing use of the words cerebral and encephalitic. They have been applied rather loosely to cases of poliomyelitis which have had marked disturbance of the sensorium. In view of the accompanying paralysis, these cases properly belong to the bulbo-spinal group. The only clinical evidence that cases of the type about to be described are poliomyelitis is the paralysis, which is usually flaccid of the lower motor neurone variety. Ultimately it may be proper to consider that profound disturbances of the sensorium in this disease are due to lesions of the silent brain areas, but we have no anatomical evidence as yet for this assumption. Consequently, if an anatomical classification is accepted for the disease as a whole, these cases must be grouped primarily according to the anatomical lesion indicated by their paralyzes. Usually this is bulbar, but it may also be spinal. Profound stupor, however, is such a striking feature that it demands position in any system of classification; but in relation to a primarily anatomical grouping, it can be placed merely as the sub-heading of a clinical variety. Therefore it is simplest to consider these as cases of bulbo-spinal poliomyelitis with profound stupor.

In its manner of onset, this clinical sub-group of the disease does not differ materially from the usual type. If there is any difference, it is that drowsiness preponderates in the early days and gradually deepens into stupor. In one case this process occupied nearly a week. The patients, of whom we had four, are brought to the hospital in varying degrees of stupor. They may lie in a sort of coma vigil, the head and eyes drawn to one side, and the eyes wide and expressionless. The face has a peculiar waxy mask like immobility, although no seventh nerve paralysis exists. The head is drawn back a little, and from time to time an expression of annoyance, almost of distress, crosses the features. Now and then a faint twitching or tremor passes over an extrem-

ity or the whole side. Yet, despite the coma-like condition, the patient can be rather easily roused by handling or prodding. There is almost immediate response and objection in the manner which has been so often seen in the other cases of this extraordinary disease, a displeased, irritated whine, and a vexed shrugging movement of the shoulders forward and upward, conveying quite distinctly the child's wish to be let alone. Other cases of this kind may show a more stuporous condition with partly closed eyelids beneath which moves a slowly rolling eyeball. These individuals may or may not have retraction of the head, and lie prostrated and somnolent. They bear a strangely similar resemblance to patients with tuberculous meningitis. Like the coma vigil cases, however, they can also be rather easily roused by manipulation or prodding, and lapse as quickly again into stupor when undisturbed. Still other patients behave as though heavily drugged, and carry out sharp commands by slow, lazy, intensely apathetic motions.

An elevation of temperature is usually present in these cases. It seems to bear little relation, however, to the degree of stupor. Thus one individual with a temperature of 99.6° F. was far more stuporous than another with a temperature of 104.2° F. Furthermore, the first case had a rise of temperature during the period of awakening from the stuporous condition.

As a rule the stupor clears with considerable rapidity, after a duration of from three to six days. In one instance the patient after four days awoke as though from sleep, looked about in a bewildered fashion and then said she wanted to go home. The other cases regained normal mental condition more slowly, but the process occupied only a few hours.

From these various general clinical expressions of the acute stage of the disease, the patients recover more or less in the same way. As the acute symptoms pass and the child again begins to take notice of its surroundings and becomes cheerful, the paralyzes although previously observed, assume the greater significance. Some cases show improvement more slowly than others. The children, as a rule, first become less drowsy and irritable. They will put out a hand into an offered palm or answer faintly in monosyllables. With some individuals this change of interest comes toward the end of the first week; with others not for two, three or sometimes four weeks. This awakening as it may be termed, is usually the beginning of improvement. From this time on convalescence is steady. Some cases seem entirely well in a day or two, while others gain in health and cheerfulness more slowly for a week or more.

It is in this period that certain interesting psychic phenomena have been observed. Some children have been sullen and unwilling to play

or be played with. In many cases fretfulness and irritability have persisted and these children cry on the slightest provocation and sob for a long while afterwards. Still other individuals, fewer in number, present a peculiar emotional instability. Often such children begin to cry for no apparent reason and a moment later, if their attention is diverted by some trivial occurrence, begin as suddenly to laugh and giggle in a typically hysterical manner.

In general, however, the children rapidly regain normal psychic poise, although in some cases there is a nervous apprehension which lasts for weeks. Furthermore, they soon lose the tired, wilted look and become rosy and fat. It is often surprising to see how quickly a very sick child looks well again, and sits up in bed smiling and happy. In such cases, only when the coverlet is drawn back and the helpless extremities appear, does one fully realize what a damaging blow the infection has dealt.

THE DIAGNOSIS OF EPIDEMIC POLIOMYELITIS IN THE PREPARALYTIC STAGE.*

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EPIDEMIC poliomyelitis is now known to be an infection of the body by a virus, which produces acute constitutional symptoms of a reactive character, the majority of its local manifestations being confined to the central nervous system. It may be said to operate on the brain and cord in a manner analogous to the typhoid bacillus on the intestine; in each disease we find phenomena peculiar to the seat of election of the invading organism, and in each disease the body is flooded with toxins; in typhoid fever we have evidence by long knowledge and experience of frequent lesions in body areas, far distant from the particular habitat of the organism, and doubtless research will one day bring to light analogous lesions as yet unknown or but guessed at in the case of epidemic poliomyelitis.

Enteric fever not infrequently occurs without any intestinal manifestation whatsoever. Poliomyelitis often occurs and often passes without palsies ever having been present. This preamble is given for the purpose of combating the old idea that acute poliomyelitis is a disease necessarily manifesting itself by flaccid paralysis, in certain segmental distributions. It is not merely such a disease but rather is primarily an acute general infection, bearing usually in its train, central nervous system lesions of quite variable characters.

This concept of the condition is necessary in order fully to appreciate its protean phenomena,

and to understand properly the methods by which we may hope eventually to combat the scourge. The bacterial, infective, and reactive theories being proven, the path is open, for the production of an efficient antiserum. In order to make use of such weapons, when by the laboratory workers they are put into our hands, we must be familiar with the clinical pictures of the disease especially in the preparalytic state,—only by such knowledge can diagnosis be made opportune.

Some cases are impossible to diagnose thus early—others difficult and none are easy. As an example of those in the class first mentioned, may be quoted the case of a boy aged twelve shown by me at the last meeting of the New York Neurological Society. This boy was, in August last, perfectly well. One day he complained of headache, but remained at play with his companions. The next day with his parents he went on board the boat for Albany, had supper as usual, ran down the companionway, and fell paralyzed from the neck downward. The power of movement was abolished in all four limbs, and control of the neck muscles was so reduced that he was quite unable to move the head. From the instant of onset, he became acutely hyperæsthetic all over the body—the limbs and trunk being also the seat of much subjective pain. There was no sensory change of an objective character. Incontinence of urine obtained for three weeks. On the night of his paralytic seizure, his temperature was 102° F.; this fever, evidently, the result of the systemic infection, merged into that of a broncho-pneumonia, on the fourth day of his illness. The progress of the case was for the best and need not here be gone into in detail. Sufficient to say that at present the boy is going about and attending school as usual with a but slight affection of both his upper and lower motor neuron systems, as residuals of his acute condition.

However in the vast majority of cases, there is a sudden acute onset of febrile symptoms which obtain for two or three days before the vascular changes in the brain and cord with their respective coverings have resulted in definite symptom-bearing lesions.

Fever is variable in intensity but is seldom higher than 101° or 102°. Headache is usual and vomiting frequent. The pulse is not often as rapid as is common in early cases of scarlet fever. The illness is usually not sufficiently severe to make the child take to its bed for a couple of days. Stupor is usual and it may here be mentioned that somnolence in the acute stage of poliomyelitis does not necessarily indicate that the stress of the infection will be directed against the brain rather than the cord. A considerable degree of stupor of rather sudden onset is usual in cases in which no cerebral lesions occur, and is the result of that general systemic infection on which emphasis has already been laid. It fol-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

lows from this remark that we are only at liberty to make the diagnosis of encephalitis, or of a cerebral type of poliomyelitis, when there developed, in the later stages of the disease, definite cerebral symptoms, as for instance hemiplegia. A general hyperæsthesia may be present not unlike that seen in rickets. Spontaneous pains are complained of especially in the lumbar regions and in the back of the neck. An accurate diagnosis is made easier in those cases in which general rigidity and Kernig's sign are pronounced. Such then are the average, initial symptoms of this disease. They are almost generic for all infective conditions; in eliminating improbable pathological states, one's argument is largely circumstantial, and positive opinions are often modified and perhaps balanced by other cognate considerations.

Influenza must be thought of. Against it one puts the seasonal unlikelihood, it being a winter and spring disease, while poliomyelitis is almost confined to the summer and early autumn months; in our hypothetical patient, the catarrhal symptoms of influenza may be absent or but ill-marked, and Pfeiffer's bacillus cannot be discovered. On the other hand, the sensory irritative phenomena on a meningitic basis are more evident than one expects in influenzal infections. However, the differential diagnosis between these two conditions is most difficult if purely clinical evidence be considered; Brorström in a bulky monograph has even attempted to establish common identity between them but his evidence seems scarcely even to have convinced himself.

August and September are the months in which occur the largest number of cases both of poliomyelitis, and gastro-intestinal catarrh. In the latter the onset is less rapid, the establishment of pyrexia less sudden, while somnolence, universal hyperæsthesia and general sweating are infrequent. Constipation rather than diarrhœa obtains in the early stages of infantile paralysis.

An arthritic type of poliomyelitis has been described and is most difficult to differentiate clinically from rheumatic fever; it is, however, of rare occurrence and the character of the periarticular swellings is commonly unlike the rheumatic affection.

It is when one comes to consider the various menigitides that one pauses in difficulty. Psychic disturbances apart from stupor, are rare in poliomyelitis, they are common in acute cerebro-spinal fever, from which poliomyelitis also differs by the very infrequent occurrence of labial herpes.

The onset of tuberculous meningitis is seldom acute; a well defined prodromal period is usually present; however, in each case in which the febrile phenomena are accompanied by signs suggesting a meningitic involvement, it is incumbent upon us to perform lumbar puncture to acquire

data of precise character. One may ask "why subject the child to the pain of such a procedure in order to know two days earlier that it will be paralyzed by poliomyelitis against which we are as yet unarmed?" This question would be the backwall of argument were it not in most cases possible by an examination of the spinal fluid to differentiate either by positive or negative data tuberculous meningitis, epidemic poliomyelitis and cerebro-spinal fever. For the first we have no specific remedy for the second, none as yet,—the last if taken in time in many cases we can cure. So,—cases of obscure fever accompanied by meningitic signs, occurring without definite and obvious cause, must be subjected to lumbar puncture on the one in three chance of success.

The fluid findings in tuberculous meningitis: To the naked eye the fluid is clear or very slightly turbid; a fine fibrinous clot usually forms on allowing the specimen to stand for a few hours. There is a uniformly strong, globulin reaction in quite early stages of the disease. The reduction of Fehling's solution by dextrose contained in normal fluid is in the majority of cases abolished. There is a constant increase of the cellular content; the bulk of the cells being lymphocytes; out of 80 fluids examined by Forbes, only four contained an equal number of lymphocytes and polymorphonuclears. In 80 per cent. to 85 per cent. of the cases tubercle bacilli may be demonstrated by teasing out the fibrinous clot on a slide, and staining by the usual Ziel-Neilson method.

The fluid in epidemic cerebro-spinal fever: In the acute stage, this is invariably turbid, or purulent, and a heavy deposit of albumen is obtained on boiling with acetic acid.

Fehling's test is positive, though this statement does not apply to cases in which the disease has become chronic, with which condition, however, we are not now concerned. There is a marked excess of polymorphonuclear leucocytes, varying from 94 to 65 per cent., with some lymphocytes and degenerated endothelial cells.

Intra- and extra-cellular gram-negative diplococci are easily demonstrated in film preparations and less easily by culture on serum or nutrose-agar.

The fluid in epidemic poliomyelitis: Here the fluid is clear, or very slightly opalescent. Clot formation, according to Sophian, is less marked than in the case of tuberculous meningitis. The globulin content is slightly raised in the early acute stage of the disease, but gradually rises for perhaps three weeks, after which it may sink to normal. The power of reducing Fehling's solution is not impaired—a relative contrast to tuberculous meningitis. There is in the beginning a large increase of white cells, which may reach the level of 1,000 per cubic millimetre. In Draper's and Peabody's cases, polymorphonuclear leucocytes formed 90 per cent. of the total,

but in the cases of Lucas and Frissell lymphocytes predominated. Apparently, however, the first change in the spinal fluid in this disease is an increase of polymorphonuclears, which, however, may only last one or two days, after which an almost pure lymphocytosis obtains. It is important to note, therefore, that in the immediate beginning of an attack of poliomyelitis the cell-picture in the cerebral spinal fluid may resemble that found in epidemic cerebro-spinal fever, but (and this is important) no organisms can be demonstrated by ordinary bacteriological methods.

The diagnosis of the abortive forms must always be most difficult, and without the information afforded by cerebro-spinal fluid examination one can only surmise the presence of this disease circumstantially in the course of an epidemic of poliomyelitis. However, in these cases, as occasionally also in those of more classical type, the deep reflexes may become diminished or may disappear as long as twenty-four hours before paralysis occurs. Eliciting the knee-jerks in infants is often by no means easy, and must be done with the greatest care; a unilateral change in reflexes is more positively abnormal than if a depression or exaggeration be found on both sides.

A case of epidemic poliomyelitis in which the disease involved only the peripheral nerves has yet to be demonstrated by autopsy. Wickman's case does not make convincing reading, while that of Modena and Cavara was undoubtedly a diffuse toxic myelitis and neuritis.

These remarks are intended chiefly to refer to the diagnosis of the disease in the earliest stages before paralysis has taken place, but these limits must be transgressed in order to consider briefly the mode of onset of diphtheritic polyneuritis—a form of paralysis sequential to a febrile state and so at times apt to be confused with poliomyelitis.

In the majority of cases of diphtheritic paralysis there is a history of antecedent "tonsillitis" accompanied by more or less fever. In some instances, however, this affection may have been very slight. Further, the pyrexial stage of poliomyelitis has been known to be accompanied by definite anginoid symptoms.

However, if the history includes a definite throat affection we must consider carefully the lapse of time between the clearing up of such affection and the onset of paralytic symptoms; in diphtheria there is a considerable interval; in poliomyelitis there is practically none.

Diphtheritic palsy begins gradually; the child weakens from day to day, and a change in gait or in ability to hold objects is usually noticed by the people in charge of the child for some time before the physician be consulted. Paralysis in poliomyelitis occurs suddenly, and reaches its maximum in twenty-four hours. The toxins of diphtheria almost invariably paralyze the soft

palate and disturb or temporarily destroy the power of visual accommodation; regurgitation of fluids may occur in poliomyelitis of bulbar type but, so far as I am aware, failure of accommodation, as a localized palsy, and apart from grave general asthenia, has never been described. Polyneuritis fails to paralyze muscle groups, and is symmetrical and distal in distribution; poliomyelitis paralyzes are segmental in type. In extensive cases of either disease these distinctions, however, are useless.

The cachectic putty-like complexion of the child fighting diphtheritic poisoning is characteristic; cardiac arrhythmia and dilatation consequent on degenerated heart muscle are most usually produced by diphtheria, never by poliomyelitis. The pseudo-paralysis accompanying either congenital syphilis or rachitis is often difficult to differentiate from epidemic paralysis; in each there is, however, a definite epiphyseal affection, and a general constitutional disease of subacute or chronic character about the existence of which one can seldom be in doubt, while in neither are there changes in the deep reflexes nor in the electrical excitability of the muscles.

It will be seen then that the early diagnosis of poliomyelitis is fraught with considerable difficulty and doubt. I have attempted to suggest the clinical signs that may chiefly guide us, but close my remarks with the statement that early cases are often clinically sterile or misleading, in which instances the results of a cerebro-spinal fluid examination may end hesitation.

THE PATHOLOGY OF ACUTE POLIOMYELITIS.*

By FRANCIS W. PEABODY, M.D.,

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THE earliest pathological studies in poliomyelitis were made on chronic cases of the disease, and the lesions described were the atrophic scars found in the anterior horns of the cord. With the development of a better clinical knowledge of the acute stage of the disease, a new pathology arose which laid especial stress on the earliest morphological changes in the cord, and explained their relation to the development of the chronic forms. The work of many investigators, and notably of Harbitz and Scheel,¹ Wickman,² and Strauss,³ has produced an accurate picture of the anatomical lesions occurring in the brain and spinal cord. The attention of

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This paper will form part of a monograph on the clinical aspects of poliomyelitis to be published by the Rockefeller Institute for Medical Research, New York.

¹ Harbitz and Scheel, *Pathologisch-anatomische Untersuchungen über Akute Poliomyelitis*, Christiania, 1907.

² Wickman, *Die Akute Poliomyelitis*, etc., *Handbuch der Neurologie*, Berlin, 1911.

³ Strauss, *The Pathology of Acute Poliomyelitis*, Report on the New York Epidemic of 1907 of the Collective Investigation Committee. New York, 1910.

observers has hitherto been almost wholly centered on the lesions of the central nervous system, and in consideration of the fact that the most striking disturbances, both pathological and clinical, are associated with the nervous system, this is not remarkable. In view, however, of the very definite and constant changes which are found at autopsy in other viscera, it is rather strange that they should have been almost wholly disregarded, and that so little emphasis should have been put on the fact that acute poliomyelitis is essentially a general infection. Rissler,⁴ Strauss, Harbitz and Scheel, and Wickman have all noted the presence of lesions outside the nervous system, but have passed them by as having little bearing on the disease. As a matter of fact, the recognition of acute poliomyelitis as a general infection has an important bearing both in explaining the clinical course of the disease and as affecting any possible means of treating it.

Inasmuch as the lesions of the central nervous system are of chief importance, they may be considered first. At autopsy the meninges are usually found to be somewhat edematous and injected. There is little increase of cerebrospinal fluid. The brain and cord, on section, have a moist, translucent, edematous appearance, and the gray matter of the cord is often swollen so that it projects above the level of the white matter. It is darker than normal in color and is typically of a grayish-pink hue. Not infrequently minute hemorrhages can be distinguished in the gray or white matter.

The exact path by which the virus enters the body is at present not definitely known, but there is clinical and experimental evidence which makes it seem probable that infection frequently gains access from the upper respiratory tract. It has been shown both anatomically and experimentally (Flexner⁵) that the upper nasal cavities are in direct communication with the meninges by means of the lymphatics which pass outward with the filaments of the olfactory nerve. The view that the virus may enter the body by means of those lymphatics and thus exert its first effect upon the meninges is strengthened by the anatomical findings. The earliest change which has been described in the nervous system is hyperemia and the collection of numbers of small mononuclear cells, probably lymphocytes, in the perivascular lymph spaces of the leptomeninges. These lymphatic spaces surrounding the vessels are anatomical processes of the arachnoid spaces, and the lymph in them is in communication with the cerebrospinal fluid. This first change, then, is an acute interstitial meningitis, which is not associated with fibrin formation or with exudate on the surface of the meninges. It is usually most marked on the an-

terior surface of the spinal cord, and especially in the anterior fissure, from which the larger vessels enter the cord, but smaller collections of cells are often found along the meningeal vessels which are situated over the lateral and posterior aspects of the cord. The blood supply of the cord is derived from the vessels of the meninges, and with the advance of the pathological process, this perivascular infiltration follows along the vessels as they enter the cord from the meninges. Thus the earliest change which is found in the cord itself, both in human beings and in the experimentally produced disease, is hyperemia and the collection of small round cells in the lymph spaces surrounding the vessels. This cellular exudate forms a sheath apparently completely surrounding the vessels for long stretches (Figure 1), and in many places the cells are so

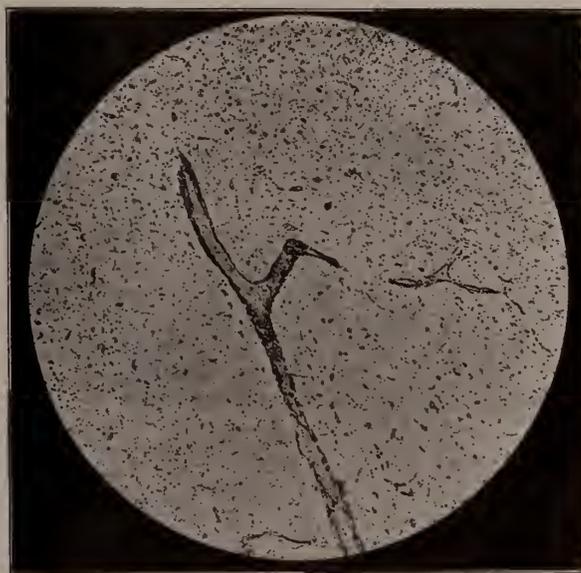


FIG. 1.—Human Spinal Cord. Lymphocytes infiltration of perivascular lymph spaces in the anterior horn.

numerous that they form thick collars which seem to press on the lumen, and thus exert a mechanical effect in obstructing the circulation. While the cellular exudate is in the outer part of the vessel wall, it is probable that there is often some effect, either toxic or mechanical, on the intimal lining of the vessels, for hemorrhages, minute or extensive, are frequent findings; furthermore, one of the prominent features of most cases is the extensive edema (Figure 2). These three factors, cellular exudate, hemorrhage and edema, all of them dependent on vascular changes, may perhaps be regarded as the primary reaction of the nervous system to the virus of poliomyelitis. The effects produced on the nerve cells themselves are probably either dependent on these vascular disturbances or they may be due to a direct action of the virus. This superior importance of the vascular system in determining the nervous lesions has for a long time explained the fact that

⁴ Rissler, Zur Kenntniss der Veränderungen des nerven Systems bei Poliomyelitis anterior acuta, *Nord Med. Ark.*, 1888, xx, 1.

⁵ Flexner, *Jour. Exper. Med.*, 1907, ix, 142.

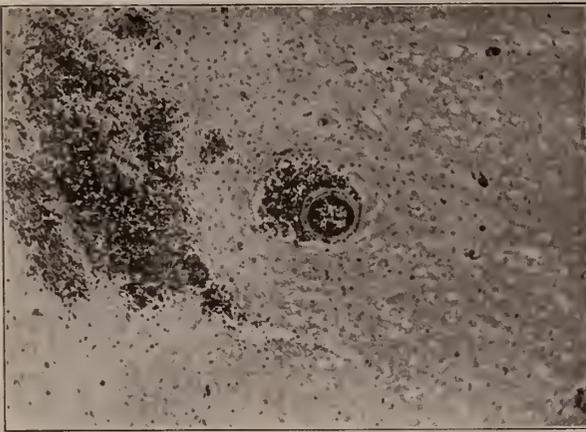


FIG. 2.—Human Spinal Cord. Hemorrhages into the gray matter.

the cervical and lumbar enlargements of the cord are most affected, and that the anterior horns of the gray matter are more involved than the posterior horns or the white matter. These are, of course, the regions of the spinal cord to which the blood supply is most abundant. Moreover, the frequency with which lesions are asymmetrical probably depends on the irregularity with which the vessels supplying the cord are given off at different levels. It has been suggested that the process by means of which the vascular lesions affect the nerve cells may be essentially a mechanical one. It is quite impossible to exclude the fact that the virus may exert some directly toxic action on these cells, but in many ways, the clinical and anatomical pictures are readily explained by the presence of the circulatory disturbance and of the exudate. On such an hypothesis the damaging effects can be assumed to result in part from the direct pressure on the nerve cells of hemorrhages, edema, and exudate. There is also the additional factor of anemia following the constriction of the blood vessels by the same mechanism. On account of this pressure and anemia, the nerve cells degenerate. If the hemorrhage and exudate are absorbed soon enough, the cells may recover their function. If, on the other hand, the anemia and pressure have been prolonged or excessive, the nerve cells go on to complete necrosis. Histological examination shows nerve cells in all stages of degeneration, from those with the slightest changes in their protoplasm to others of which only a granular detritus remains. A most striking picture is formed by the entrance of polymorphonuclear neurophages into the necrotic nerve cells (Figure 3). A single nerve cell may be invaded by a dozen of these phagocytes and by means of them necrotic material is completely disposed of. In more severe lesions, one sees the hyperemia, the perivascular infiltration, hemorrhages, edema, and a diffuse cellular infiltration throughout the gray and white matter, but nerve cells may be completely absent from the picture. These changes,



FIG. 3.—Spinal Cord of Monkey. Polymorphonuclear neurophages in the anterior horn.

most prominent in the anterior horns of the gray matter, are not sharply circumscribed, but are scattered more or less diffusely through both the gray and white matter of the cord.

The same sequence of changes, vascular disturbance and subsequent degeneration of the nervous elements, is found to a less degree in the brain, medulla, and pons. Hyperemia and a moderate amount of cellular infiltration may be found in association with the vessels of the cerebrum and cerebellum, but lesions extensive enough to produce motor symptoms are exceedingly rare. The medulla and pons show some slight degree of involvement in most cases, and one frequently finds in them a marked cellular exudate and many hemorrhages. It is noteworthy, however, that it is often extremely difficult to reconcile the clinical symptoms, which are referable to pontine lesions, with the actual autopsy findings. Cases which have shown bulbar paralyses in life may fail to show adequate anatomical lesions to account for them, and other cases, which have given clinical evidence of spinal involvement only, may show extensive changes through the pons and medulla.

Of practically constant occurrence are the lesions in the posterior root ganglia. The histological changes are similar to those which take place in the cord itself. There is an infiltration of small round cells in the lymphatic spaces surrounding the vessels which enter the ganglia from the meninges. This has been shown experimentally to be the first step in the process. Then follows a more general, diffuse exudation of cells, degeneration and necrosis of the nerve cells, and finally the entrance of polymorphonuclear leucocytes into the necrotic cells and removal of the disintegrating cells by neurophages (Figure 4). The suggestion has been made that these lesions in the sensory ganglia may in part account for the pain which is such a constant feature of the acute stage of the disease. Another element in the production of pain is the cellular infiltration which is found along the nerve roots.

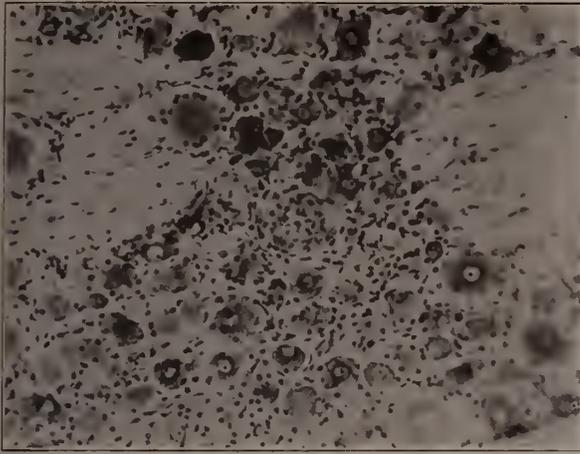


FIG. 4.—Posterior Spinal Root Ganglion. Lymphocytic infiltration. Degenerating ganglion cells, neurophages.



FIG. 5.—Human Lymph Gland. Zone of lymphocytes surrounding pale centre which is composed chiefly of large endothelial cells.

The changes which are found in other organs in acute poliomyelitis are less striking than those in the nervous system, but they have been, in our experience, practically as constant. In all of the eleven acute cases which we have been able to examine, there has been more or less extensive involvement of the lymphoid tissue and of parenchymatous organs. The lymphoid tissue throughout the body appears to react to the virus. The Peyer's patches of the intestine and the mesenteric lymph glands show perhaps the most marked acute swelling. The mucosa over the Peyer's patches is, however, unaffected. There is also definite, and sometimes pronounced enlargement of the substernal, bronchial, cervical, axillary, and inguinal lymph glands and of the tonsils. The spleen is frequently somewhat enlarged, and on section the Malpighian corpuscles stand up in raised, pale, obvious, translucent nodules. The thymus shows changes identical with those in the lymphoid tissue elsewhere. On histological examination one is struck by the resemblance of the lesions found to those described by Mallory⁶ in typhoid fever. The reaction is in general the same throughout the lymphoid tissue, regardless of its location. On histological examination some of the lymphoid nodules may present a normal appearance, but the majority consist of a zone of lymphocytes surrounding a more or less sharply circumscribed pale center (Figure 5). High magnification shows the center of the lobule to consist chiefly of large endothelial cells with oval vesicular nuclei. These cells are similar to the cells lining the lymph sinuses, but most of them are larger, more swollen, and take the stain very lightly. Sometimes the nuclei look like pale shadows, and the outline of the protoplasm is so faint that it can scarcely be distinguished. Where they are closely packed, the individual cells appear to be fused together to form compact masses. The better

preserved of these cells are markedly phagocytic and frequently contain many particles of necrotic cells. These cell inclusions are surrounded by a lightly-stained halo and are apparently situated in vacuoles in the protoplasm. Scattered throughout the center of the nodule are many broken down cells and granular fragments of necrotic nuclei. The cells which are going to pieces are for the most part lymphocytes, but the endothelial cells also seem to swell up and finally disintegrate. In areas with extensive necrosis there is often an invasion by polymorphonuclear leucocytes.

In the lymph sinuses there are also large numbers of the same phagocytic endothelial cells. Many of them are of great size and contain necrotic fragments of nuclei, whole lymphocytes, or numbers of red blood corpuscles. In the lymph sinuses, there is extensive proliferation of the endothelial cells, as is evidenced by the frequency with which mitotic figures are found. Numbers of necrotic cells are met with in the lymph sinuses, but in general necrosis is a more prominent feature in the centers of the lymphatic nodules and proliferation in the lymph sinuses.

Among the parenchymatous organs, "cloudy swelling," such as has been frequently described, is usually met with. In the liver, however, there are other more striking changes, and these again resemble in character what has been described by Mallory and others in typhoid fever. They are for the most part sharply circumscribed areas, ranging in size from lesions which consist of one or two cells to others which include nearly one-eighth of a liver lobule, in which degeneration of liver cells and infiltration of lymphoid cells and polymorphonuclear cells have taken place. The number of these necroses is very variable. They may be rather difficult to find, or there may be many of them in a single low power field. The lesions are apparently closely asso-

⁶ Mallory, *Jour. Exper. Med.*, 1898, iii, 611.

ciated with the blood vessels, and while chiefly with the portal vein, they are also associated with central or sublobular vessels. The section is however sometimes cut so that the relation to the blood vessels is not directly evident. The lesions are round or oval in cross section, but there may be long finger like projections, extending out from the main area, and involving one or two columns of liver cells. It is striking that the liver cells directly adjacent to the infiltrated areas are usually completely spared, but occasionally one finds that some of them show a homogeneous quality of the protoplasm, and an exaggerated affinity for eosin, which suggest a beginning involvement through a peripheral spread of the lesion.

The character of the lesion varies, of course, with its size and age, but in general it is very constant. In the earlier lesions one finds one or two disintegrating liver cells, with homogeneous, hyaline, pink-staining protoplasm, and occasionally with irregular, distorted nuclei. In the older lesions, even more apparent than the necrotic liver cells is the evidence of an early and rapid proliferation. Scattered through practically all the lesions are small groups of liver cell nuclei, frequently a nest of three or four nuclei surrounded by infiltrated tissue, or several nuclei apparently beginning to proliferate within a degenerated liver cell body. The protoplasm around these dividing nuclei may appear as a faint pink halo, or it may be quite impossible to make out any protoplasm at all. In older lesions the protoplasm is better defined and the cells have frequently arranged themselves circularly, in acini, or in double columns. This arrangement of cells simulates that in normal bile ducts, but it is found in association with nearly all the lesions, irrespective of their position in the lobule, although most frequently adjacent to the portal spaces. According to the position of the infiltrative lesion, much or little fibrillated tissue appears among the degenerating and infiltrating cells. The greater amount of fibrillated tissue occurs in and adjacent to the portal spaces, where all the lesions of an early cirrhosis may be displayed. That this condition is of the nature of a beginning cirrhosis is further indicated by the microscopic depressions of the capsule of the organ, where they extend toward and reach that structure. However, the process probably is not permanent, since it is so young and cellular that it can readily undergo retrogression; while the infiltrated nodules elsewhere in the lobules are surely easily subject to restoration. One case has indeed come to autopsy, two months after the onset of poliomyelitic paralysis, affecting both legs, the child dying of a laryngeal diphtheria. In the liver of this case were remains of the portal infiltrative lesions described and, in addition, younger necrotic and infiltrated lesions among the columns of liver cells. The former probably had been greater and were diminishing; it is uncertain whether the

later were residues of the poliomyelitic infection or the result of the recent diphtheritic process. That these changes in the lymphoid tissues and in the liver are, in fact, a part of the reaction of the body to the virus of poliomyelitis, would seem to be made certain by the fact that exactly similar lesions may be found in the organs of monkeys which have been experimentally infected with the disease (Flexner⁷).

The demonstration of such wide-spread reaction to the virus is wholly in line with recent clinical and epidemiological advances which tend to recognize acute poliomyelitis as a general infection. The disease must be regarded as a generalized process which affects parenchymatous organs, lymphoid tissue, but more especially the nervous system. It is possible that two distinct effects of the disease on the organism should be differentiated. On the one hand is the general toxemic process which affects organs throughout the body, but which apparently acts mildly. On the other hand is the local process in the spinal cord, producing death by destruction of the nerve cells controlling respiration. The anatomical findings which point to an action of the virus of poliomyelitis on the lymphoid tissue throughout the body may well be correlated with the results obtained by the inoculation of emulsions of lymphoid organs into monkeys. Not long after the disease was first transferred to monkeys by the intracerebral inoculation of filtrates of the spinal cord, the virus was proved, in the same manner, to be present in a mesenteric lymph gland. Since then similar positive results have been obtained with still other lymphatic glands in the monkey, and with emulsions of the tonsils in man and the monkey.

These observations are not, however, of the same significance and importance. What they tend to indicate is that the living virus may come to rest for a time in organs outside the central nervous system, to which it is conveyed by the blood. It does not establish that the visceral lesions outside the nervous system are caused directly by the virus, rather than by some secondary toxic substance produced in the course of its proliferation. Since the only means at present available to demonstrate the presence of the virus is the inoculation of monkeys, the tests made are too few to determine how widespread in the organs the virus really is. It is established that it is present in the central nervous system, even when it cannot be demonstrated in the viscera generally. But the finding of the virus in the tonsils and nasal mucosa with as great constancy as in the nervous system indicates that these organs play a part in the conveyance of the virus into and away from the central nervous system. The virus is regularly present in them in fatal and doubtless in non-fatal cases of poliomyelitis in children, and it has been demonstrated in the nasal mucosa and the tonsils in infected

⁷ Flexner, *Folia serolog.*, 1911, vii, 1101.

monkeys; it finds its way into the nasal mucous membrane, even when injected into the peritoneal cavity. The evidence, therefore, is strong that, as was first pointed out by Flexner, the upper respiratory mucous membrane provides for both the ingress and egress of the virus of the disease, through which infection is produced and the renewal of the cause of the disease maintained.

THE TREATMENT OF INFANTILE SPINAL PARALYSIS.*

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IT HAS long been a regrettable fact among medical men that therapeutic measures in the treatment of disease have not been rendered more of an exact science. It is lamentable along the whole line of medical endeavor. It becomes a matter of self reproach and a reminder of the shortcomings of our noble profession whose whole history from its very inception has been one of altruism and self sacrifice.

These oft-repeated proofs come home to us with greater force when the disease in question is one that selects its victims largely from the innocents without regard for race, from our best families of good and noble stock, raised under the most favorable hygienic and sanitary conditions, as well as from the poor or improperly nourished dwellers, in city or country alike, whether inhabitants of the dark foul smelling tenements or on nature's playground with abundance of sunshine and pure oxygen. A disease that on the whole has been on the increase for the last five years and of which more cases were reported in northern part of the United States than from any part of the world. Too much credit cannot be given to our pathologists and scientific investigators, to our great and endowed institutions of medical research for the knowledge they have so freely given us of the channels of infection, of the possible means of contagion, and the various theories as to the source of the virus of infantile paralysis. The bald fact, however, still remains that there are thousands of cases of paralysis existing as a result of this dread disease. They should merit the very best of our thought and attention, and should by unremitting effort be rendered as full as possible of hope and promise.

In becoming a part of this symposium and in attacking the more or less threadbare subject of treatment, a discussion be stimulated that will unearth and bring to light one single point of value, one mere kernel of meat, those that have taken part will feel that their labors have not been in vain.

In general, treatment should be directed first

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

to an attempt to lessen severity of attack, and to efforts to render patients more comfortable during course of symptoms. Second to the restoration of lost function and the prevention of deformity, and third to prophylactic measures to prevent spread of disease. So far as treatment is concerned disease may be divided into the early stage and the late stage, or the stage of onset and the stage of paralysis. It is difficult if not impossible to alter the course of the disease. Many times the diagnosis is not made until paralysis develops. If the disease be recognized or suspected in its incipiency what means have we at hand to control its course? We have none that is satisfactory. None that is really specific. A successful serum to my knowledge has not yet been made. Partly because we are not always able to make the diagnosis in prodromal stage. Treatment must be directed to control of the primary meningeal lesions so far as drugs are concerned. An antiseptic having special power to destroy virus in the meninges and in cerebro-spinal fluid, but with low toxicity seems to be what is required. Urotropin seems to give a measure of hope and an offer of encouragement, although its powers are limited. It should, however, always be tried as soon as diagnosis is made. It should be given in divided doses. A child of three years may take 25 or 30 grains daily. Whether or not its antiseptic power may yet be intensified so that it will be more efficient and still applicable to human beings would be difficult to predict, but it is not improbable that some advance should be made along this line. General measures to be employed are rest, counter-irritation and general attention to emunctories, diet, hygiene, etc. It is well to insist upon the recumbent posture being maintained for a long time with position changed from time to time so as not to become tiring and to avoid the contraction of bed-sores. It is not policy, however, to retain the recumbent posture for too long a time. Judgment should be used and as soon as there be no recurrence of pain the child should be encouraged to move about all possible and in this way aid restoration of function. Considerable difference of opinion exists as to efficacy of counter-irritation in the early stage. Some maintaining that it being painful in itself is irritable to painful parts. Here again much caution should be used. The writer is a firm believer in hot wet packs applied to spine, or in a mild galvanic current in skilled hands. Cloths rung out of mustard water or turpentine stupes applied along the spine and changed frequently are undoubtedly of value. Sedatives such as aspirin and caffeine for the control of pain may be resorted to. In the attention to the bowels divided doses of calomel and soda and castor oil are the best drugs to use. Soap and water enema, are preferred by some. The ice pack is occasionally used, and with benefit.

This brings us to the late stage where every effort should be bent to the treatment of disability and the restoration of lost function. Medical treatment at this time should be supplemented by the aid, coöperation and advice of the orthopedic surgeon from whom we shall hear later. No definitely established rule can be laid down for treatment in this stage, this being due largely to the fact that no two cases are alike and it is difficult to estimate extent of the pathological involvement. Then, too, we cannot well stick to any established precedent to guide us. Some cases seem to have a tendency to recover without treatment, the so-called abortive cases, which are probably the results of a mere pathological edema, or a slight hemorrhage, but not enough to result in nerve degeneration. Some authorities are of the opinion that after paralysis occurs the damage is done, and that treatment is of no avail. They admit that improvement occurs but argue that it is independent of and uninfluenced by treatment. The argument is put forth that a dead organic cell cannot be regenerated by any known method of treatment, exercise, massage, electricity, etc. It is hard to conceive of every cell of a part as being lost. An undegenerated cell may take on the work of a useless neighbor. It is rare also for all the muscles of an extremity to be affected. Sometimes only one or two being affected. Good muscles then may take up the burden of performing the function of the part particularly if they receive special stimulation to do so. Muscle power returns continuously but slowly for years, and during all this period treatment should be maintained. Although the advice of the orthopedist should be constantly sought parents must not be lulled into the belief that mechanical means alone, unaided by physical measures are going to affect the best possible cure. The limb should be placed and retained in a normal position, so that the enfeebled muscles are placed under the best possible conditions for their recovery. It is fallacy to pursue the ordinary physical measures to assist the restoration of function unless this be done. It would also be decidedly irrational to pursue a medical treatment of doubtful utility.

The writer is of the opinion that the most valuable form of treatment at this stage is muscle training or exercises designed to imitate the function that has been lost. The aim should be to assist the diseased muscles to use whatever power they may have left, to their own advantage. It is impossible to plan out any definite series of exercises that would fit each case, as in every case we may have a different problem to face. In general these exercises may be said to be of two kinds. First the kind that is done by the parent or nurse at the direction of the physician. The patient in this case is placed in the best possible restful position. The weakened limb is then forcibly extended and flexed for several minutes by the hands of the operator,

particular care being taken to avoid harsh or rough measures and not to overdo. These movements act as a suggestion to the little patient, who then should be asked to perform these movements without aid as strength returns. To give the child a familiarity with what is required, movements should be made against resistance, increasing the amount of resistance as strength increases. Caution should be observed not to tire the little patient. These exercises should be performed daily, ten or fifteen minutes at a time on each part, and kept up for months and even years if need be. Another form of exercise for more advanced cases, those that are able to get about some, are in the form of toys and mechanical appliances with which they may play, or play at working. The object of these are to provide something that will interest them, appeal to them and not prove irksome. Much ingenuity may be used in studying out such form of exercise. Again in many cases much can be done by strong personal suggestion, or even discipline, to get the child to commence to use again a limb in which the function has been lost for many months. The child in many cases has become a household pet on account of its invalidism and is very wilful. Fear also has to be overcome. This fear to use the limb having been engendered by several mishaps. But the suddenly discovered ability to be able to use a limb that has been dormant for weeks whets the appetite for more, and progress is rapidly made. Games and toys that enable the little patient to imitate papa and mama are always good. A stationary bicycle is good exercise for a bad leg. A music box that turns with a crank is good exercise for a bad arm. A toy xylophone affords good exercise where both arms are involved, or a toy piano or even a real piano for weakened fingers. In referring to music a child with a so-called ready ear will often unconsciously exercise hands and arms if slow rhythmic music be played. The child beating time or attempting dancing movements is beneficial. A toy carpet sweeper for a little girl who may want to imitate a maid is a clever device for either affected arms alone or even for weakened function of legs, because it will stimulate walking. There is no end to what may be devised, but the keynote through all must be everlasting persistence. Much depends upon the interest and intelligence of parents or nurse and the personal equation of the physician. It is not enough for the physician to say in a perfunctory way that certain rules must be followed, but he must see to it personally from time to time that his directions are being faithfully and intelligently worked out. Massage is a very useful adjunct as treatment and should be performed daily for about fifteen minutes to each affected part just prior to the exercises. It overcomes tendency towards wasting and improves circulation.

There is considerable difference of opinion as

to the value of electricity. This is due to the fact that it is difficult to measure its value. If used at all it should only be in the hands of an experienced person. In testing electrical responses, if the muscle responds freely to the faradic current, this current should be selected for treatment. If muscles do not respond at all to faradic, use galvanism for treatment. Every other day is regarded as often enough for administration. Large, well moistened electroids should be used without interruption. It is not presumed wise to use an interrupted current in a muscle much degenerated for the reason that what little vitality the muscle possesses might be destroyed. These statements are mere generalities as opinions vary widely. Exponents of the static wave current hold out most optimistic beliefs as to its value in anterior poliomyelitis and in all spinal cord conditions. They believe that a degree of vibration and tissue contraction is produced sufficient to penetrate dense muscular structures, with sufficient energy to favorably effect a congestive process in spinal cord.

There are those who profess to believe that neither massage or electricity are of value as suggestive treatment, and that they have no local effect on muscles whatever, and that their only value is to convey to the brain impulses to contract the muscles and that in the interrupted galvanic current we have an object lesson producing in the mind of the child a desire to imitate this movement. Hope of benefit should never be lost until all suitable means shall have been persisted in for a long time. We must enlist the untiring efforts of parents and friends. We must discourage as far as possible a state of mind such as a crippled condition may engender, and fill its place with hope and enthusiasm.

PREVENTION AND CORRECTION OF DEFORMITIES BY MECHANICAL TREATMENT.*

By WISNER R. TOWNSEND, M.A., M.D.,

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THE great prevalence of infantile paralysis of late years has produced an extensive literature, and although the writers may differ on many questions, all are agreed that the most constant and characteristic symptom is the paralysis. This may come on early in the disease and is often the first symptom to suggest the diagnosis or it may appear at varying times after the onset of the fever. Of 200 cases analysed in the Massachusetts Report for 1910 the occurrence was as follows:

	Cases.
Same day	20
One day	31
Two days	40
Three days	34
Four days	15
Five days	11
Six days	11
Seven days	14

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the balance occurring at different periods up to the eighth week. The permanency and the extent of the paralysis are also matters of great importance. The early paralysis may involve many muscles which subsequently recover more or less completely or the primary paralysis may involve a few muscle groups or single muscles which may or may not remain paralyzed. Cases where the paralysis appears in one portion of the body at one time and in another at a subsequent time are infrequent; as a rule the primary paralysis is more extensive than the permanent. The views of the writer coincide entirely with the statement in the report already referred to that a study of the age, distribution of the early paralysis and duration of the tenderness and paralysis in these cases leads to the conclusion that the early symptoms offered no means of distinguishing cases that would recover entirely from cases where the paralysis was to be permanent. The cases that fully and permanently recover are estimated at from 10 to 25 per cent. by various authors, but while this should lead one to be optimistic in prognosis it also should lead to greater care in early treatment so that the most favorable results may be obtained.

The distribution of the paralysis is of the utmost importance from the standpoint of the prevention of deformity because it is known that paralysis of certain muscles produces definite deformities in time unless steps are taken to prevent such results. The original paralysis may be of slight importance in that it may only involve one muscle, for instance the tibialis anticus. Untreated or badly treated a severe valgus, an exaggerated form of flat foot with or without equinus may lead to a deformity most difficult to correct, and one that may require an extensive surgical operation or the deformity may persist and seriously cripple the individual despite the best efforts of the surgeon, and such a foot may even be made worse by a poorly planned and badly executed surgical procedure. In some instances the operation may be a success and the subsequent result a failure due to lack of proper after treatment. Practically all such cases need a brace after the operation, but despite all that the orthopedic surgeons have said and written on the subject braces are seldom applied, if one is to judge from the relapses or faulty cures which come to orthopedic institutions for further treat-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

ment. The distribution of the early paralysis¹ in the cases from Massachusetts was as follows:

	Cases.
One leg only	145
Both legs only	146
One arm only	44
Both arms only	12
One arm and leg, same side.....	50
One arm and leg, opposite sides....	18
Both legs and one arm.....	32
Both arms and one leg.....	8
Both arms and both legs.....	51
Ataxia (transitory)	7
Back	79
Abdomen	38
Neck	13
Respiration	39
Deglutition	12
Intercostal	1
Face	7
Right Face	31
Left face	24
Strabismus	2
Not stated	32

The paralysis is a serious matter but the later effects are still more serious and many of these can and should be prevented. To allow a deformity to occur and then treat it is unscientific and harmful, to prevent it if possible is scientific and helpful. The production of the deformity is due to several causes: 1. Gravity. 2. The action of non-paralyzed muscles. 3. The arrested development and growth of all tissues in proximity to the muscles paralyzed. 4. The results of weight applied to weakened structures. 5. All other causes².

A brief reference to the causes and methods of production of the deformities that follow a muscular paralysis will not be out of place and will perhaps impress upon the practitioner more forcibly than in any other way, the necessity of early mechanical treatment for the prevention of deformity.

1. Gravity. The force of gravity and its method of action are easily understood. The simplest examples are an equinus due to a dropping of the fore part of the foot when the extensors or as they are also called, dorsal flexor muscles of the foot have lost their power, a wrist drop when the extensors fail to do their part in preserving the equilibrium between the anterior and posterior muscles and gravity pulls down and lengthens the paralyzed muscles and later those on the opposite side which are not affected contract and make or increase deformity. Where both anterior and posterior muscles of the foot and leg for instance have lost their power gravity also acts, but slight

deformity may be produced, as neither the muscles in front or back can act to increase or make it permanent.

2. The action of non-paralyzed muscles—active muscles when unopposed may produce deformity independent of gravity or may even produce results against the force of gravity. Not only must the action of both the affected and non-affected muscles be studied but one must also take into account the strength of the individual muscles when acting along normal lines and when acting along abnormal lines as the result of a change in position of the bones or other parts to which the muscles may be attached. This is well shown at the knee where a complete change of position occurs if the muscles and lateral ligaments are stretched and a genu recurvatum produced. The action of the quadriceps femoris and the hamstrings is altered, they no longer act as they did in the normal, and non-paralyzed muscles act at a disadvantage.

"In certain cases as the deformity develops and increases, the mechanics of motion change, so that the relation of the power to the fulcrum and the fulcrum to the weight or the portion moved is entirely unlike the original condition. This is seen when all the posterior muscles of the calf are paralyzed with the exception of the two peroneals. The action of these muscles normally, is to extend the foot at the ankle, and to abduct or turn out the front part of the foot, the fulcrum being the posterior edge of the malleolus. There being no power in the gastrocnemius or in the muscles of the inner side of the back of the leg to control the peroneal muscles, their action gradually stretches the internal lateral ligaments and the whole foot is drawn outward. The internal malleolus becomes more prominent while the outer malleolus is less so, owing to the turning out of the foot. Mechanically, this places the outer malleolus or the fulcrum over which the peroneal tendons act, distinctly inside the line of motion. As the result of this, the tendons are gradually drawn outward, until they slip over the edge of the malleolus and rest on its outer surface, and in cases of long standing, well toward its anterior edge. With the tendons in this position, the action causes flexion and abduction instead of extension and adduction."³ A study of the manner in which the opposing muscles act will also show that it is different in rest and when motion occurs, thus in the trunk the action of the opposing muscles is to a certain extent overcome by the respiratory act which is more perfect on the healthy side and causes a concavity of the spine on the paralyzed side. Paralysis of the serratus causes the deformity known as "angel wing," which is slight when the scapula is at rest and very marked when the arm is raised. Many other examples might be cited to show the

¹ Infantile Paralysis in Massachusetts in 1910. Reprint from State Board of Health.

² Deformities Due to Muscular Paralysis, etc. W. R. Townsend, *Medical Record*, May 3, 1902.

³ Goldthwait. Transactions Am. Orthop. Ass'n., 1895.

results of muscular action but these suffice to call attention to the subject.

3. The arrested development and growth of all tissues in proximity to the muscles paralyzed. The arrest of growth and development varies much. In cases where the paralysis may only involve one or two muscles of a limb it may be slight or severe while in severe paralysis the same may be true. The most severe cases of paralysis may interfere but slightly with the growth or development of the bony tissues and where both limbs are apparently involved to the same extent one may develop more rapidly than the other, but in the majority the lesser degrees of paralysis cause less interference with growth than do the severe. The deformity effects are often remote, in that they affect distant parts. A short limb may produce a tilted pelvis or a lateral curvature. A deltoid paralysis may produce a drop shoulder and a subsequent wry neck. The failure to properly develop as the result of paralysis of leg and thigh muscles may be a knock knee or a bow leg or a club foot or some other deformity.

4. The result of weight applied to weakened structures. This is of great importance because it not only tends to produce deformity but to increase it after it has begun. A patient may have a slight paralysis of the foot muscles and walk well and without producing a deformity, but suppose the individual increases greatly in weight due to lack of exercise or any other cause, or suppose extra efforts, long walks or running are indulged in, the increased weight and increased efforts cause a deformity. Strains or sprains of the ankle are frequent causes of flat foot even where no paralysis exists and with added weight and weakness sprains are more liable to occur than in normal conditions.

5. All other causes. Under this heading may be included faulty shoeing, the use of improper mechanical appliances, disease such as various forms of arthritis and osteitis, traumatism such as fractures and dislocations, wounds involving muscles and nerves, tuberculosis, syphilis, emphysema and other diseases.

Of late years the opportunity to study the occurrence and development of deformity has forcibly impressed upon the writer the necessity for early orthopedic treatment in poliomyelitis, and in 1908⁴ over 300 cases were carefully studied and many more since then. Deformity was found to occur in many cases very early. In a case of genu recurvatum it was present in two days, in a case of calcaneo valgus also in two days, in a case of genu recurvatum in one week and in 66 patients where apparatus was applied, the average date after the attack was three months, but the average date for appearance of deformity especially in severe cases is much less. With a moderate degree of paralysis, no matter

what the form of treatment, if the leg muscles were seriously involved and no effort made to prevent a deformity, if the patient put weight on the limb a beginning deformity could confidently be predicted in most cases in two months. Many such were seen who were treated elsewhere and came back for mechanical treatment in from one to two months after the onset of the disease. In the eight months preceding April 1, 1908, apparatus was ordered for 66 patients, all recent cases in which deformities were present or beginning. In none did the deformity progress or become permanent. The type of deformity was:

Drop foot	6
Genu recurvatum	25
Talipes varus	3
Talipes eq. varus	3
Talipes valgus	9
Talipes calcaneus	7
Talipes calcaneo-valgus	2
Talipes equinus	14
Lateral curvature	2
Drop wrist, etc.	1
Weakness abdominal muscles	3
Right valgus ... }	1
Left calcaneus .. }	
Right drop foot }	1
Left valgus }	
Multiple deformities	3

During the period that these patients were presenting themselves for treatment, three cases were also seen of the same epidemic where deformities had occurred that required anesthesia before they could be overcome. In one, the thigh group needed stretching, and in one case of equinus a tenotomy was necessary. These are not included in this list.

The reports of the Hospital for the Relief of the Ruptured and Crippled for the last five years show a very large number of patients with infantile paralysis and the number of braces supplied indicates the value placed on such treatment by the surgeons in attendance. In many cases they were applied to prevent deformity and the results have been most gratifying. The recovery has been more rapid and more complete than in those that were neglected. But the large majority of cases are not seen until deformity has occurred. For these results the profession is responsible and just as preventive medicine demands that the patient should be warned of the dangers of disease and the possibilities of their prevention by vaccination, etc., so will an enlightened public and profession demand that patients be warned of the possibilities of deformity and the methods of prevention. Where deformity has occurred proper mechanical treatment may succeed in correcting it partly or entirely and in many cases it should be tried, in others surgical or some other form of treatment is indicated, but this does not come under discussion in the portion of the symposium assigned

⁴ The Necessity for Early Orthopedic Treatment in Poliomyelitis, by W. R. Townsend, *Am. Journal Orth. Surgery*, August, 1908

to the writer. When braces are used other forms of treatment should not be neglected. The Hospital reports show new cases of poliomyelitis.

1907, year ending October 1.....	296
1908, " " "	742
1909, " " "	507
1910, " " "	1006
1911, " " "	606

Apparatus furnished for paralytic deformities during these years:
Report for,

1907, year ending October 1.....	199
1908, " " "	297
1909, " " "	354
1910, " " "	400
1911, " " "	471

It must be stated that in the year 1907 an epidemic of poliomyelitis occurred in and around New York and the number of cases for June, July, August and September presenting for treatment was 265 as compared with 25 for the same period in 1906. This accounts for the large increase in 1908, 1909 and 1910. Increased knowledge on the part of patients and physicians also caused many to apply for treatment and this maximum was not reached until 1910. Future reports will probably show a steady diminution unless a new epidemic occurs. The increase in braces supplied, however, will probably continue and now bears but slight relation to the frequency of new cases. Old braces have to be replaced and those supplied in earlier years are now coming back for renewal in increasing numbers. It also shows increasing use of mechanical treatment.

The following conclusions may be drawn from a study of the subject. The majority of cases of poliomyelitis are followed by deformity. The amount of deformity depends on the character of the attack, on the muscles involved and on the treatment. Practically all of these deformities can be prevented by appropriate treatment. Deformities may occur very soon after the attack. The prevention of the primary deformities tends to greater degree of recovery and prevents the secondary deformities.

The early orthopedic treatment of the after-effects of poliomyelitis gives better results than do other forms of treatment, and will enable one more satisfactorily to perform, when indicated, the various operations devised for these cases, and the large number of operations now necessary to correct deformities, in the future will be greatly reduced.

THE SURGICAL TREATMENT OF THE DEFORMITIES AND DISABILITIES FOLLOWING POLIOMYELITIS.*

By HENRY LING TAYLOR, M.D.,
NEW YORK CITY.

THE most frequent problem presented to the surgeon by a poliomyelitic, months or years after the attack, is the restoration or improvement of the ability to stand and walk, and the brief time allotted to this paper will be devoted to this problem. It should be remembered that locomotion is not only a practical necessity, but that it is of the utmost importance for the patient's happiness and for the proper development of mind and body, so that the patient's desire to stand and walk is an entirely reasonable one. Even very imperfect walking is much better than the entire helplessness that so often persists after an attack, until mechanical or surgical relief is given; and I know of no greater happiness than that afforded by the sight of the first steps of a child who has been confined to the bed or to a wheel chair since the attack, it may be five or ten years before.

Station and locomotion after poliomyelitis are hampered by weakness and deformity, especially of the trunk and lower limbs.

The leg deformities are practically all preventable, and if the early mechanical treatment were attended to, the surgery of poliomyelitis would be reduced by more than one-half.

When one of these helpless or lame patients presents himself the surgeon should examine for unstable joints, and for fixed deformities, at the hip, knee, ankle, and spine, as well as test the amount and distribution of muscular power in the limbs and trunk. In connection with this functional and topographical survey, it should be noted that the distribution of muscular power may be more important than its total amount. For example if the flexors are partly competent and the extensors incompetent, the condition is made worse by strengthening the flexors, which are already a deforming force. This is an important practical point often lost sight of in electrical and massage treatment. To put it another way, a functional balance between opposing muscle groups is of primary importance to standing and walking, whereas a large preponderance of strength on one side of a joint is often a distinct disadvantage. The stronger the muscles which are pulling a joint into an awkward or deformed posture, the worse for the patient.

The first requirement for the restitution of locomotion is to bring the lower limbs into correct alignment for weight bearing by the surgical correction of fixed deformities. Except in extreme and inveterate cases this can usually be done by simple subcutaneous tenotomies, fasciotomy and myotomies, combined with manual

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

correction. Severe contractions at the hip and knee are often better corrected through open incisions; occasionally a knock knee may require an osteotomy, but a vast majority of the moderate cases may be successfully handled by simple division of the contracted tissues, or by tendon shortening or tendon lengthening. Paralytic deformities should be adequately corrected but not overcorrected; for example, after dividing the heelcord, the foot should not be forced into calcaneus, as this deformity may persist. Having restored the foot and limb to its most useful posture by these comparatively simple means, and held them by means of plaster splints until the parts are sufficiently consolidated for weight bearing, it will be found that after properly balanced shoes are fitted nothing more is required in a considerable number of cases. In a much larger number it will be found, however, that the question of stability still confronts us. We find unbalanced muscle groups tending to pull the part back into the previously deformed posture, when it is surely useless to encourage them in their vicious work by electricity or massage, or we will find the normal muscular support lacking on one or more sides, or a loose or flail joint too unstable to afford adequate support to the body. These conditions must be met by the opposing support of a splint or brace worn during the daytime, by an attempt to strengthen the weak muscles by tendon transplantation, or to support the part by silk ligaments or by an ankylosing operation (arthrodesis), designed to permanently stiffen the joint in the posture of choice.

There is no question in the writer's mind that tendon transplantation has been unwisely and uselessly done in vast numbers of cases and that final results have often been disappointing. Many of the cases submitted to this operation have continued to wear their braces, and are unable to leave them off. Even in those cases that are considered successful, the improvement is usually due to the preliminary correction of the deformity, or to implanted tendons acting as ligaments, rather than to any useful amount of acquired voluntary motion. One of the surgically most successful cases noted was a transplantation of the hamstring tendons into the patella in a case of palsy of the knee extensors, done in Berlin and observed years afterwards in New York. The result was voluntary power to hyperextend the knee some 30 or 40 degrees beyond straight, and no power to flex, so that locomotion was most difficult with a grotesque reverse bend at the knee. This had to be corrected by an operation, after which by wearing a brace the patient walked very well. In this case and in many of those observed the desired result could have been more simply and better obtained, by division of contracted structures, supplemented when necessary by braces or by ankylosing operations or possibly by the introduction of silk tendons.

The writer would not be understood as decrying tendon transplantation, which is still on trial, in cases properly selected and studied, but haphazard or indiscriminate application of the operation can only end in disappointment. The best technic of tendon transplantation is that of Dr. Fritz Lange of Munich, who visited this country two years ago and demonstrated his methods in several Eastern cities.

The operation of increasing stability and preventing deformity by implanting silk ligaments into bone, as practiced in Boston and Chicago, seems to be a promising one in appropriate cases.

The operation of arthrodesis is frankly designed to lock up the unstable joint in a useful posture, and seems to have a wide application and to promise better and more lasting results than its principal competitor, tendon transplantation. The ankle joint may be immobilized in the posture of choice by removing the joint surfaces, including a thin layer of bone through an anterior or posterior incision, thus preventing toe drop or heel drop. A varus may be stabilized by removing a wedge of bone on the outer side of the foot, including the calcaneo-cuboid joint, and a valgus by similar treatment of the astragaloscaphoid articulation. The knee may be similarly locked up, or the hip ankylosed to prevent the recurrence of paralytic dislocation. A clever adaptation has been made by Whitman in his operation for calcaneus deformity, where all the weight is borne on the heel. The astragalus is removed through Kocher's external incision, and the foot displaced backward, and put up in a plaster splint with the forefoot dropped. A brace holding the foot in moderate equinus should be worn for a year or more. The results are excellent; when pressure is put on the ball of the foot, upward motion is blocked, but limited motion at the ankle remains. This as well as most of the more elaborate operations succeed best when the patient is at least eight or ten years old.

After most of the operative work for poliomyelitics careful mechanical treatment is of the greatest importance. Apparatus holding the parts in corrected position should usually be worn for a year or more, until the resistance of the parts is adequate to the strain of weight bearing and locomotion. In a case of arthrodesis of the knee done by one of the best surgeons of England, and carefully splinted for two or three years, the knee finally became stiff in marked flexion and required a reëxcision five years after the first operation. Failure to adequately splint for a sufficient time after operation is one of the commonest causes of a poor result.

A word in regard to nerve grafting may be expected. In a number of cases of neuroplasty done by other surgeons and followed for several years by the writer, the operation has been without benefit. There are few, if any, at present

who advocate its use for the disabilities following poliomyelitis.

In extreme and inveterate cases of paralytic deformity excellent results may be obtained by properly planned operations even in adults. The writer has done several where the deformity was of twenty or more years standing. From some of these this unlooked for fact has appeared, namely; muscles so locked up by deformity, that no function or power was observable before the operation have emerged from a twenty years' rest with efficient function. In two cases of extreme equinus one of nineteen and one of twenty-five years' standing, no power of ankle extension could be observed before the operation, but when the foot was removed from the splint a few weeks after tenotomy and lengthening of the heel cord, there was useful voluntary ankle extension. When such things happen, what becomes of the practice of trying to keep muscles alive by electrical treatment?

Paralysis of the abdominal and spinal muscles is not uncommon and frequently gives rise to intractable scoliosis. These trunk palsies are often an important and difficult factor in the problem of putting the patient on his feet. It occasionally happens that trunk palsy is severe with little or no involvement of the leg muscles; in such cases support of the trunk by a brace or corset may be the most important factor in the treatment.

In conclusion:

1. Paralytic deformities at least of the lower limbs, may and should be prevented.
2. Paralytic deformities, whether in children or adults, may and should be corrected.
3. The large majority of cases unable to walk since the attack, even where the disability has lasted for years, can be put on their feet.
4. Those who can walk, but in whom locomotion is difficult and unsatisfactory, can usually be materially improved.
5. A combination of judicious surgery with careful mechanical treatment will usually give the best results.

Discussion.

DR. RUFUS I. COLE: The various features of poliomyelitis have been fully discussed this morning, and I will only emphasize a few points in regard to this terrible disease.

For a number of years there has been a difference of opinion among pathologists as to whether the changes in the nerve cells are primarily due to the direct effect of a toxin or are secondary to disturbances in nutrition, dependent upon changes in the local circulation. It is interesting that the newer studies on the pathology of this disease have led the investigators to lay more and more stress upon the effect of the circulatory disturbances, while less and less importance is being attributed to a direct toxic action.

At the Hospital of the Rockefeller Institute during the past year a clinical study of the disease was undertaken and special effort was made to obtain information in regard to the early stages. If we are to do much in relieving the great misery caused by this disease, it will probably have to be either by limiting the spread of the infection, or by obtaining a specific method of treatment. To render effective any measures for limiting the spread of the disease, methods must be discovered to render possible the recognition of the mild and abortive cases and to facilitate early diagnosis in the more severe cases. Moreover, it is evident that to make any therapeutic measure effective, it must be employed very early, before degeneration of the nerve cells has occurred. During the progress of our study it has been interesting to note that while at first the positive recognition of the early cases was difficult, as the season advanced and the clinical picture of the early stages of the disease became better impressed upon our minds, the difficulties of early diagnosis became less and less, and this in spite of the fact that no single specific diagnostic measure has yet been discovered.

In regard to Dr. Kennedy's statement that the cells in the cerebro-spinal fluid are chiefly of the polymorphonuclear variety, our experience has been somewhat different. In only two of our cases during the prodromal period was the relative number of polymorphonuclear leucocytes in the cerebro-spinal fluid increased. In the four other cases which we studied, the great majority of cells present were of the mononuclear variety. In all cases during the acute stages of the disease the cells in the spinal fluid were mainly of the mononuclear type.

Most of the foreign observers have stated that in the circulating blood a leukopenia is present, together with a relative increase in the number of lymphocytes. Our experience has been directly contrary to this. We found in most cases a moderate increase in the total number of leucocytes, together with a moderate relative diminution in the number of lymphocytes and a relative increase in polymorphonuclear cells.

Finally, in regard to the classification of the cases on the basis of the clinical features of the disease, we have come to the conclusion that the terms "encephalitic" or "cerebral type" should not be applied indiscriminately to all the cases showing marked disturbances of the sensorium, such as stupor and delirium, but that these terms should be restricted to those cases which show definite evidence of cerebral or upper neurone involvement, as evidenced by a spastic paralysis.

DR. CHARLES OGILVY: There are a few practical points to which I wish to refer on this most interesting subject of poliomyelitis. One is that in our work with this disease we have found that the abortive type and that which has resulted in paralysis have occurred side by side in different members of the same family. Which proves that

the same infection may result in one or the other of these types of disease.

There were two definite cases of this kind that came under my care. In each instance the brother and sister were infected. One—the brother in each case—had a distinct abortive type, and the sister in each case had a severe attack resulting in a marked and general paralysis.

The practical point to which I wish to call your attention is the importance of recognizing these abortive types because of the infection that is liable to occur from these cases as it is from the more acute conditions recognized.

The other point to which I wish to call your attention is the one made by Dr. Hoag. He spoke of the treatment as being "everlastingly persistent." This I wish to emphasize. Right here I would like to make a plea for those cases which are apparently hopeless and which are passed over by the general practitioner as being without help. These are cases in which paralysis is extreme and may have lasted for two or three years previous to the time of being seen. I recall a case of this kind which presented itself in my office after having remained for a year with complete paralysis of the lower extremities, with the exception of the power of flexion of the left thigh. This little fellow was three years of age and had not been able to move from his bed. After two years of hard work he is able now to walk with braces and crutches.

Only those who have seen the first step taken by a patient after long months of immobility are able to appreciate the keen satisfaction experienced by them when able to walk again.

In our work at the New York City Children's Hospital we have on an average forty cases of anterior poliomyelitis constantly under our supervision. A small minority of these cases are unable to get about. Notwithstanding the fact that they are perhaps the worst cases one might find, as they are those who have passed through other hospitals in New York City and are sent "dernier resort" to the Children's Hospital. These cases, let me emphasize again, are not hopeless except in a very few instances, and the possibilities of our being able to enable them to walk again should be more frequently recognized.

DR. HENRY LING TAYLOR referred to the importance of enabling these patients to walk. He made a plea for the neglected and apparently hopeless cases in which by treatment, mechanical and operative, one is enabled to get these patients into a condition whereby they are able to get about. The results, mentally and physically, are much better than one might expect, so that it is well worth while to work over them.

DR. FOSTER KENNEDY: In reply to Dr. Cole with regard to the changes in the cerebro-spinal fluid in the beginning of the disease, I think Dr. Cole must have misconstrued what I said. I said in Dr. Draper's and Dr. Peabody's cases the poly-

morphonuclear leucocytes formed ninety per cent. of the total, but in other cases the lymphocytes predominated. This statement refers only to the precise inception of the infection: the initial change in the cerebro-spinal fluid in this disease is apparently a polymorphonuclear leucocytosis which, however, lasts at the most but two days, after which an almost pure lymphocytosis obtains.

DR. BRAINARD H. WHITBECK: There is one question I would like to ask of those who are familiar with the work at the Rockefeller Institute in view of the recent investigations, and that is, the question is often raised by the medical man as to the immediate use of massage and electricity. On more than one occasion I have heard the neurologist or the medical man advocate starting right in with massage and electricity, in order to prevent the muscles from atrophying. It seems to me, we have an inflammatory process here which, if it does not subside, results in paralysis, and if this overstimulation is brought about at this early period, irreparable harm can be done to the overstretched muscles or their fibers by interference with the subsidence of the inflammatory process which is at the root of the condition. I should like to ask what their opinion is in regard to this matter. It seems to me, that the paralyzed limb should be put at rest and in a position which will best relax or relieve the stress on the paralyzed or weakened muscles.

DR. GEORGE DRAPER: We found that the time for beginning massage was determined best by the patients themselves. For until the tenderness of the disease had gone they would not permit even the gentlest manipulations. As soon, however, as the children ceased to complain, massage was begun and given twice a day for fifteen minutes. Passive motion was added after a few days. We have not used electricity in any case. Dr. Flexner's hypothesis here was that with the persistence of the inflammatory process in the cord for an unknown and variable length of time following the initial attack, a possible reflex visitation from the periphery might delay healing.

DR. DAVID E. HOAG: I believe the brunt of the work that is being done in anterior poliomyelitis is being accomplished by the orthopedic surgeons and pathologists. The pathologists are certainly doing a great deal to discover new light on this subject, and the orthopedists are doing better work along the line of correcting paralytic diseases. It is up to the clinician to recognize the disease in its incipency and to aid in doing away with the many cases of paralysis.

The papers that have been read by Dr. Kennedy, so far as diagnosis is concerned, and the picture drawn by Dr. Draper regarding the acute stage, will be of incalculable value.

Regarding the massage and electricity directly in the acute stage, it should not be used, but it should be commenced as soon as possible with the idea that electricity and massage are of bene-

fit to those muscles which may still aid in restoring function to the part.

DR. HENRY LING TAYLOR: There is just one thing I would like to add on the subject of surgery, and that is, that while a large majority of the cases are unquestionably to be benefited by mechanical treatment and surgery, there is occasionally a case that should be let alone. An instance of that sort came under my observation not long ago of a man, nearly thirty years of age, who had had palsy since early childhood. His legs were all doubled up; he had scoliosis; his arms were paralyzed, and in spite of that, he was selling newspapers, moving about in a chair. He was brought to me, and I was earnestly requested to do something for him, but I absolutely refused, mainly on account of paralysis of the back muscles, because even if his legs were straightened, he could not use them on account of the weakness of his arm and back muscles. He went to another city, was operated by a too optimistic surgeon, and died in twelve hours.

DR. WISNER R. TOWNSEND: I have nothing further to say on the mechanical treatment. There is one point that should be emphasized repeatedly, namely, if a patient with poliomyelitis is brought to a physician for examination, the child should be examined from head to foot in order that a complete knowledge may be had of the condition of the entire muscular system, and the milder forms of paralysis made out as well as the more marked ones.

RUPTURE OF THE KIDNEY IN CHILDREN.*

By C. L. GIBSON, M.D.,
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RUPTURES or other subcutaneous injuries are very uncommon in children, only 22 cases being reported. My experience comprises four cases of complete rupture in children from eight to twelve years old, and a consideration of the conditions found furnishes some interesting features.

CASE I.—Barbara S., age 10. Admitted to St. Luke's Hospital, August 25, 1902. Two weeks ago was kicked by a horse, on the right side of the body: unconscious for a while. Next morning urine contained some blood, none seen since. Some swelling of the right side developed with a considerable amount of pain. Has had no chills; but there have been fever and sweating.

Physical examination showed a bright, healthy child, with a visible swelling of the right lumbar region. No superficial discoloration. The swelling was elastic, insensitive to pressure, flat on percussion. Urine—Acid 1918, no albumen.

Operation.—Right lumbar incision showed the

swelling to be a large retroperitoneal accumulation of normal appearing urine. The kidney was ruptured in two, the lower pole entirely separated from the upper three-fourths of the viscus. Nephrectomy, good recovery. Discharged October 3d.

CASE II.—These details are as exact as I can furnish them from memory, the record being lost.

Boy, about 10, admitted to the Hudson Street Hospital probably in the summer of 1907; run over injury, abdominal symptoms, median laparotomy by a colleague, negative findings. Seen by me several days later, diagnosis of rupture of left kidney. Lumbar incision revealed complete tear of left kidney. Nephrectomy, good recovery.

CASE III.—James L., 12. Admitted November —, 1909, to the Hudson Street Hospital.

While running across the street an automobile struck him in the left side, knocking him down. Scalp wound requiring two stitches. Brought to the hospital by the guilty automobile. Soon began to complain of great pain and tenderness over the left kidney region. Physical examination: tenderness and rigidity in left hypochondrium, also some slight discoloration. Skin and mucous membranes of good color. Shortly after admission passed blood tinged urine. Hemoglobin color index 70 per cent. Operation about eight hours after injury: left lumbar incision, complete rupture of kidney in two pieces: nephrectomy, drain, good recovery, highest temperature 100½ deg. F. Discharged in three weeks.

CASE IV.—M. S., girl, aged 8, admitted to St. Luke's Hospital July 26, 1910, complaining of pain in the "stomach." Two days before she had fallen a distance of four and a half feet, landing on the ground on the right side. Went home, complained of pain in her stomach which has continued ever since. Bowels regular. No trouble with urination, no blood in the urine, has vomited twice. Physical examination: negative except for the abdomen, which shows general rigidity with tenderness on the lower right side. Temperature 102 deg. F. Blood count, leucocytoses 2,500, polynuclears, 88 per cent. No urine record. Probable diagnosis appendicitis. Immediate operation. Intermuscular incision; on separating the muscles, a considerable amount of fluid blood evacuated. On opening the peritonium a similar fluid escaped from the pelvis; the cœcal wall was the site of considerable ecchymosis. Appendix normal (removed). The wound was dilated retroperitoneally to allow of a sponge being pushed up into the lumbar region, it returned bloody, but without evacuating any fluid. Injury to the kidney seemed probable, it could be palpated quite readily, but no obvious abnormality being detected (intra capsular rupture) it was decided to await further developments.

The child recovered well and seemed relieved. The urine the next day (17th) was: Neutral

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

1 Watson and Cunningham, Genito-Urinary Diseases, Vol. II.

1,034 very faint trace albumen, a few hyaline casts.

July 20th, Urine—Acid 1,014, very faint trace albumen, a few leucocytes.

July 21st, Acid 1,020—Albumen 10 per cent., many red blood cells. In view of this last urine report, exploration was undertaken. Right lumbar incision; the true capsule was found intact, but distended with blood and raised from the kidney; on opening it, the kidney was found broken completely in two, the lower smaller fragment showing beginning necrosis. Nephrectomy, drain. Perfect recovery. Discharged August 9.

The case is interesting, showing a complete rupture resulting from a relatively slight trauma, leaving no mark on the body and producing *absolutely no shock*, the masking of kidney symp-

other operation would have been permissible. Three of the children have been under observation and remained well.

As regards the etiology of such severe injuries, it is obvious that children are relatively little exposed to the various forms of trauma commonly encountered by active men (96% of all cases). Most modern observations seem to corroborate Küttner's view that the kidney being a semi-fluid body bursts along the line of least resistance according to the law of hydraulics. Direct pressure from the lower ribs can also explain it. It is less easy, however, to understand the effects of indirect violence as from a fall on the feet. A point, however, to be borne in mind, illustrated in two of my cases, is that the severest form of damage may result from an injury unaccompanied by



toms by the bruising of the lower abdominal muscles and the colon, the absence of any urinary symptoms till five days after injury, and also that the kidney may be divided completely in two without appreciable solution of continuity of its capsule. Four complete ruptures of the kidney in children under twelve occurring in the practice of one surgeon seems unusual in view of the small number of such cases on record. It is possible that these cases are really not so rare and may be overlooked with disastrous results by those who hesitate to interfere in dubious cases. The similarity of the lesions is interesting, being exactly alike in all four cases—complete division of the viscus in two parts, the lower one being the lesser. In one instance the capsule remained unturned.

The fact that the kidney lesions were the same with the different kinds of violence seems to confirm the theory of "bursting" by hydraulic pressure. Also the line of rupture—vertical to the long axis at about the junction of the two lower thirds would seem to indicate that we had here an instance of a definite line of least resistance such as I have not seen indicated in any of the treatises on the subject.

Although the lesions in all these cases was severe, the symptoms on the whole were mild and in several ways deficient. Nephrectomy was necessary in every instance, and successful, no

marks of external violence on the surface of the body in the kidney region or anywhere else. Possibly in some children a persistence of the infantile ptosis² may persist leaving more of the surface unprotected by the thoracic bulwark. The particular vulnerability in childhood has also been ascribed to the minimum deposit of perinephric fat and the greater tension of the overlying peritoneum.

The *extent* of the lesion naturally runs the gamut from the mildest of superficial bruises to the complete rupture observed in my four cases—to the tearing away of the kidney from its vascular pedicle or the ureter or complete pulpyfying from extraordinary crushes. In the less extensive injuries it is of practical importance whether the tear involves or extends into the pelvis—whether larger vascular trunks are destroyed with resulting dangerous hemorrhage or jeopardizing the future vitality of portions of the organ—whether the injury is subcapsular and finally whether there is a coexistent tear of the peritoneum or injury of the contiguous viscera. Unfortunately few if any of these lesions can be diagnosed *with certainty* as regards their extent, particularly at a period when early interference may be all important. A consideration of the nature of the violence is helpful. Injuries re-

² Aglave, Bulletin de la Soc. d'Anatomie de Paris, 1910, p. 595.

sulting from direct violence will probably produce a rupture of the kidney *alone* by "bursting" violence. Gross direct violence such as "run over" accidents are more likely to result in complex lesions. The intensity of the violence is, however, not a trustworthy guide as shown by Case I where a complete rupture resulted from the kick of a horse that left no mark on the skin. It must also be borne in mind that a pathological kidney may rupture from the most trivial accident (Watson's case of the woman whose hydronephrotic kidney ruptured from muscular action—washing windows).

The loss of blood resulting from any of these injuries naturally varies. Generally speaking it is rarely sufficient to endanger life quickly; it is rather the constant and recurring hemorrhage that is most to be dreaded. Even with extensive rents of the kidney, the integrity of the capsule tends by tension to check extraordinary bleeding.

As regards diagnosis it may be stated broadly that a diagnosis of some degree of injury to the kidney presents little difficulty. Statistics give a history of hematuria in 80 per cent. of the cases and certainly with painstaking microscopic urinary examinations this figure would be increased. It will not ordinarily be difficult to exclude lesions of other portions of the urinary tract, *e. g.*, of the bladder, practically always complicated by a fracture of the pelvis. The history or evidence of an injury which may implicate the kidney will generally be elicited, pain, tenderness and eventually more or less pronounced signs of the extravasation of blood or urine or both in the marked cases will accentuate the diagnosis and also indicate the side involved. For unusual cases and conditions the cystoscope or ureter catheter may be used; but as a routine these are uncalled for as well as unwise, and in children can scarcely ever be used and if requiring anesthesia had better be replaced by a harmless and more satisfying exploratory and *therapeutic* lumbar incision.

What is most difficult is to determine the *extent* of the lesion and particularly as regards the condition which most urgently call for interference. The initial symptoms with the exception of the degree of shock and hemorrhage do not present any features which sharply indicate the severity of the damage, it is rather on the development and sequence of secondary manifestation that we have to rely or perhaps waste valuable time.

Very severe injuries or very mild ones may be usually diagnosed with readiness, especially with a definite knowledge and appreciation of the nature of the causative violence. For instance, a child is run over by a heavy wagon, as reported by a competent witness,—there are extensive marks on the body, there is abundant and early, perhaps immediate, hematuria, there is marked shock. Given these conditions there should be a

severe laceration of the kidney and perhaps of other contiguous organs, possibly entailing a laceration of the peritoneum overlying the kidney. These complicating conditions may not always be obvious at the outset, although these marked and dangerous symptoms will manifest themselves later,—too late probably to remedy them.

On the other hand, a lad may be hit a severe blow in boxing—the so-called "kidney blow"—feels a good deal of pain, may be temporarily dizzy or sick at his stomach, sooner or later the urine is tinged with blood. Such a history and such findings indicate a trifling condition requiring no active treatment.

It is, however, the cases of moderate severity or of incomplete symptoms that are the most difficult to judge. The degree of initial shock is alone no criterion, it may be intense certainly for a short time with only a trifling injury, it may be insignificant or *wanting* with the severest damage. The degree of hemorrhage is also misleading, a small vessel may bleed savagely for a while and if the bulk of the hemorrhage finds a ready escape down the ureter we shall have an alarming picture for a perhaps trifling condition. On the other hand, mechanical obstacles,—rupture of the pelvis or ureter (or blocking) clotting or absence of considerable hemorrhage from the kidney, may result in little hematuria even in the presence of the severest damage.

Absence of visible marks of external violence is no criterion, for complete rupture may occur despite this negative evidence (Cases I & IV).

The significance of a swelling in the flank varies a good deal. If considerable and early it usually means extensive damage. Some of it may be due to the trauma to the abdominal wall, some to the bulk of the extravasated blood, some to the reaction of irritated intestines inhibiting peristalsis, or to an actual lesion of the gut, or later to a peritonitis due to extravasation of urine, or an infection of the retroperitoneal tissues or from associated injuries.

The amount of urine collecting in the tissues will depend on whether the injury involves a rupture of (a) the capsule, (b) the pelvis, (c) ureter, and whether the urine can accumulate in a well defined space, or whether opportunity is offered for extravasation into the tissues or the peritoneum. Tuffier has shown from animal experiments and clinical observations have corroborated that the lacerated renal surface *per se* allows little or no urine to escape.

Later swellings may be due to secondary infections. A considerable and increasing well defined (colon pushed forward) swelling with remission of acute symptoms and absence of inflammatory signs would indicate the retroperitoneal accumulation of a well walled off collection of urine whose escape down the ureter is

shut off,—exploratory puncture (if deemed wise) will prove the condition.

It is obvious that we are not able to diagnose accurately the extent of many of these lesions. We know also that many such injuries, while not rapidly producing death, may do so eventually on account of the many complications that may arise. My feeling is that we should not hesitate in dubious cases to *complete* our diagnosis by an early exploratory lumbar incision which will also fill a useful and probably necessary therapeutic role. Not many years ago we thought ourselves competent to differentiate the several forms of appendicitis; few surgeons today care to take such a risk and prefer to replace doubt with certainty, and I believe that the varying possibilities for harm of a kidney lesion furnish a reasonable analogy.

As regards prognosis, statistical data of large series of cases have been collected to show results both of the condition, and the value of the various forms of treatment, but it is doubtful if the older figures have much value today.

Suter³ in 1905 found in a study of 701 subcutaneous injuries of the kidney:

Total mortality	18.6%
Mortality of 131 treated by nephrectomy.	16.7%
Mortality of 143 conservative operations.	14.6%
Mortality of 427 treated expectantly....	20.6%

If these figures are of any value at all, certainly an expectant treatment which has a mortality of over 20 per cent. does not make a very impressive showing. With modern technique, generalization of skilled operators, efficient means of combating shock, etc., to refrain from operation satisfied with a mortality of 20 per cent. cannot be accepted as progress. Watson showed in a series of 99 cases of operation in which the condition of the kidney called only for minor procedure there were only seven deaths, the cause of death being found generally to conditions independent of the operation proper (injury of the other kidney, peritonitis). Watson has formulated the indication for treatment as follows:

Cases Suitable for Expectant Treatment. 1. The milder forms of the injury.

2. The cases in which there is reason to believe that both kidneys have been injured, the signs being external evidence of injury on both sides, tumor in both loins, and anuria.

3. Cases in which there are injuries of other parts of the body of such grave character as to make futile any operative treatment of the renal lesion.

Cases Demanding Operative Treatment. 1. All in which there is evidence of progressive hemorrhage, *e. g.*, increasing pallor, pulse of declining strength and increasing rapidity, sighing respiration, and, locally, a tumor in the loin which

is increasing in size, or an increasing amount of free fluid in the peritoneal cavity in the cases complicated by intra-abdominal injuries.

2. Hematuria which persists for a long time, even though the quantity of blood is at no one time large; hematuria in which there is a large amount of blood, even though it has not lasted long; hematuria which recurs after having ceased; sudden cessation of a previously profuse hematuria, and, if there is no reason to believe that both kidneys are injured, absence of hematuria.

3. Anuria which continues for more than thirty-six or, at most, forty-eight hours, and if there is no reason to believe that both kidneys are injured.

4. Cases in which there is evidence of intra- or perirenal suppuration or of peritoneal infection.

My own feeling would be that we should refrain from *immediate* operation in

(a) All milder cases, presenting no one symptom of any severity and giving a history of injury which is presumably of no great violence.

(b) Cases of generalized injury with a very bad general condition and absence of urgent kidney symptoms.

For the latter class I would urge an exploratory operation with an appreciable increase of any or all symptoms at an early date. Operation in some form then is indicated for all milder cases that show a tendency to increase their symptoms and for all other cases, barring those falling in class B. My attitude in the border line cases would be, when in doubt operate, believing that by such a routine measure we will not let some seemingly mild case slip through our fingers. As regards the time of operation, in general one should operate as early as possible, but if the main symptom is not that of an increasing anemia (repeated examinations of the hemoglobin) one might well occasionally give the patient a few hours to pull himself together, though such a delay should not be entertained if we have associated intraperitoneal injuries calling for prompt relief.

OPERATIVE TREATMENT.

As a rule the incision should give an extra-peritoneal approach by the lumbar route,—it is the most direct, avoids infecting the peritoneum and does not require handling and blocking off of protruding intestines. Moreover it will provide the safe and efficient drainage demanded in most of these conditions. An anterior incision should be reserved for injuries which presumably involve the intraperitoneal organs—even in these cases a supplementary lumbar incision for drainage may be indicated particularly if a nephrectomy is not performed.

Treatment of the injured kidney. Nephrectomy should be reserved for the cases in which

³ Suter, *Beit. zur klin Chirurgie*, Band 47.

the integrity of the kidney cannot be preserved and when it is obvious that hemorrhage cannot be effectually stopped or prevented otherwise, or the outflow of the urine into the ureter cannot be efficiently restored. In the event of doubt arising, regarding the integrity of the other kidney, nephrectomy may be deferred until sufficient information is obtained. Meanwhile the injured kidney should be attended to, peritoneum if torn sutured or packed, laceration sewn if advisable, the pelvis drained and the whole or part of the wound packed and drained efficiently. Where nephrectomy is not required suture or packing with drainage will suffice. How much more efficient suture rather than packing a lacerated area will prove is to me an open question. I think not much time should be lost in performing it and it should perhaps be reserved for cases in which packing may less efficiently check bleeding. The main indication is to provide free drainage which will minimize the disastrous secondary effects of injury and extravasation.

This paper is written to call attention to the fact that rupture of the kidney in children is probably commoner than generally estimated. That the lesion is frequently severe, consisting of a complete division of the kidney into unequal halves. That shock and other symptoms may be slight and out of proportion to the gravity of the lesion. That operative interference should be more freely employed and gives good results.

Discussion.

DR. EUGENE FULLER, New York City: I agree with Dr. Gibson as to the necessity for an exploratory operation in these cases of rupture of the kidney. I have in mind an interesting case of a man who had a rupture of the kidney. It is an unusual case. He was a laborer. He worked in a meat establishment where during his work he was to have a quarter of meat drop on his shoulder, run with it, and throw it in some place. When one of those quarters of beef was dropped on his shoulder he said he felt a sharp pain in his right loin, and soon after that began to pass blood for some time afterward and had trouble in the kidney. I found rupture of the kidney had taken place; disorganization was occurring. It was ruptured by countracoup by this sudden injury.

In looking up the literature I found a case reported where a young woman had had her kidney ruptured by her partner at a dance, who seized her around the waist with such violence as to cause her kidney to rupture. This case is one argument against that form of dancing.

DR. IRVING S. HAYNES, New York City: I would like to emphasize one point, and that is the fact that hematuria is not a reliable symptom indicative of kidney lesion, or to put it this way; the severer the kidney injury, the less likely is the patient to have marked hematuria; that hema-

turia is indicative of the milder forms of kidney lesions. The absence of blood is apt to indicate a severer form of lesion. The reason is patent, because the severer form may tear off the ureter and the blood collect in the loin and not pass down the ureter into the bladder; consequently we should not place too much reliance or dependance upon that symptom.

I have had two children whom I have treated for this condition, and, as Dr. Gibson says, the cases are notable for the fact of the slight traumatism necessary to produce rupture of the kidney. In an extensive rupture the kidney may be divided entirely in two, with the absence of what you may call pathognomonic symptoms; but the fact of the matter is that you ought to operate on general surgical principles, and do so quickly.

THE VALUE OF THE MUNICIPAL CONTROL OF CHILD HYGIENE.*

By S. JOSEPHINE BAKER, M.D.,
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HOFFMAN has stated, in his work on the "Sphere of the State," that "that is not the best government which governs the least, but on the contrary, that which enters most deeply into the real needs and daily interests of its subjects" and, further, "the ultimate responsibility for the child is with the state, and it should spare no means to make the child as useful a member of the state as the capabilities of the child and the given circumstances permit."

Over one hundred years ago, the state, through its power of government, recognized this responsibility by deciding that a citizen, to be useful, must be literate, and for this purpose established its system of free public education. To-day the state is recognizing that a citizen, to be useful, must be healthy, and in acting upon this principle has ultimately come to the realization that preventive health work among children offers a vast field of potential possibilities, not only in the prolongation of life, with a decreased death rate, but in the greater efficiency of those who live, with correspondingly decreased poverty, delinquency and dependency. Modern sanitary science seeks to counteract those conditions which further the development of the so-called preventable diseases. As life, measured by the years of its normal duration, approaches and passes its meridian, the preventable diseases decrease in the frequency of their occurrence. Approximately one-fifth of all deaths at all ages occur during the first five years of life. At least one-half of these are preventable. The deaths from infectious diseases are mainly encountered between five and fifteen years of age, while tuberculosis, which causes more deaths than any other single disease, is mainly dependent upon a lack of natural or acquired resistance, and it is

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

probable that this latent tendency has its inception during the period of childhood. The effort to eliminate tuberculosis will be successful only in proportion to the recognition of this knowledge, for public health work among children offers a solution of the tuberculosis problem in the only way it ever will be solved, and that is by primarily preventive measures.

The vast alien population of our cities, the congestion of population, economic strain and lack of adjustment in living conditions, are matters which must cause us the greatest concern, for, whatever may be the effect upon the adult, it is certain that it in no way approaches the serious results that are found in the case of infants and children born and doomed to live among surroundings which afford them little or no opportunity for a normal, sane or healthy life.

Cities in themselves are causing the very conditions which sanitarians and social workers are now using their efforts to correct. If cities produce the factors that mean excessive infant mortality and high disease incident among children, the cities must pay the cost of their own neglect, and as a measure of self-preservation bend their energies towards the elimination of those features which have caused this serious and wholly deplorable condition of affairs. The cost, measured in dollars and cents alone, may seem great to the unobservant and those unfamiliar with the existing status, but from the point of view of the preservation of the state in assuring good health to the next generation, it is infinitesimal and unworthy of consideration. The children of our vast alien population are our real American citizens in the making. Keen, intelligent, actively interested in all features of their new life, they furnish a never-ending source of inspiration to those of us who know them, and work through and among them. Not only are they the vulnerable points of attack in educational public health work, but they are physically the material itself upon which the force of public health work must be expended. Their future value to themselves and to the nation depends upon their knowledge of those laws which make for physical and mental well-being. Thus, while health work among adults must be largely restrictive and corrective and often disappointing in its results, public health work among and for children can be made preventive in its highest meaning, and the results are well worthy of all the time, money and energy expended in producing them.

In line with these principles, the Department of Health of New York City, organized its Division of Child Hygiene in August, 1908. Since that time at least one other large city has followed its example, while in each one of the other large cities the question is being actively discussed and all possible efforts are being made to obtain the necessary funds to allow such an organization.

A question which has never been decided, and

which probably never will be, is the actual money value of a human life. Court decisions, which might be taken as a standard, show a fluctuation so wide that no standard can be deduced. The basis has usually been placed upon the earning capacity and as infants' and young children's earning capacity is rated as nil, the money value of their life or an estimate of their future productive capacity based upon good health is exceedingly difficult to determine. It has, however, been stated many times without dispute, that the value of the life of an infant under one year of age is \$100. With this as a basis, it may be seen that fifteen thousand infant deaths in New York City last year alone meant a money loss of \$1,500,000.

In its efforts to reduce infant mortality, the Department of Health of New York City made a strenuous and energetic campaign during 1911. While it is not possible to estimate the exact number of lives saved which may be charged with any degree of accuracy to the credit of any particular organization working in this field, yet from the point of view of the city and its expenditures, it may readily be demonstrated that the actual cost of saving the baby's life is considerably lower than the loss involved in allowing it to die. Some few years ago, the New York Milk Committee, after a series of investigations, stated that the average cost of medical attendance and funeral services for each baby that died in New York City was fifty dollars. During 1911 the death rate in the Infants' Milk Stations conducted by the Department of Health was 2.4%; in the district work of the department under the charge of the visiting nurses, the death rate was 1.4%. The cost of this service amounted to about two dollars a month for the milk station baby and about sixty cents a month for the baby who was cared for in its own home. The total reduction in infant mortality for the year in actual numbers was 1,183, or a financial saving of \$118,300. Even though such a method of reasoning may be used to prove the point I wish to make, yet it would seem unworthy of consideration when compared with the humanitarian side of this life-saving project. The saving in human anguish alone cannot be computed, and the conservation of life means more to the state than the conservation of any of its more material resources can ever mean.

The exact financial value of the medical inspection and examination of children who are attending our public schools is impossible to estimate. It has never been possible to determine with mathematical accuracy the exact number of non-promotions due to physical defects or the influence on promotion of the medical correction of these defects. Many other factors must be considered, as the mental equipment of the child, the character of its instruction, the idiosyncrasies of teachers and the variability of the methods governing promotions, but that the physical con-

dition of the child bears a very direct relation to its progress in school is an accepted deduction that may safely be made as a result of the knowledge we already have upon this subject. In fact, this statement is almost superfluous, as it is a matter of common reasoning that a sick child is necessarily not in a condition either to attend school regularly or to profit by the instruction that is given to it.

In New York City since 1908, 727,750 children in the public schools have received a complete physical examination. Of this number an average of 40% were found to have one or more associated physical defects such as defective vision, adenoid growths, enlarged tonsils, defective nutrition, pulmonary or cardiac disease, orthopedic defects and tubercular glands, with or without the most common defect that we find, namely, defective teeth. 35% of the remainder of the children examined were found to have defective teeth as the only physical defect. Such a condition certainly merits consideration as it is quite evident that these defects have been hitherto unrecognized and untreated and that it is the duty of the city, in order to protect itself, to use all reasonable means to see that the children are given an opportunity to be placed in normal physical condition. In the schools alone the efforts of the Division of Child Hygiene have resulted in an immense gain in school time for those children who were affected with contagious eye and skin diseases, the necessary exclusions from school attendance for these reasons being reduced from over 57,000 in 1903 to slightly over 3,000 in 1911.

Of the children who were found to have physical defects other than the single defect of teeth, approximately 80% have been placed under medical care. Our experience in New York also coincides with that of all other communities where a similar system of supervision of the health of school children has been in operation. The general improvement in the health and cleanliness of the child, and the home hygienic conditions which have a distinct bearing upon the health of children, are manifest to anyone who compares the status of the city child to-day with that obtaining a few years ago.

One objection which has been raised by the medical profession in regard to this work should not pass unnoticed. It has been alleged that the assumption by the city of the responsibility for the health of school children has made serious inroads upon the practice and income of private physicians. In order to ascertain the exact condition in relation to this matter, I have had tabulated for the year 1911 the various sources from which children have received treatment. During that year, of the 65,150 children treated, 37,986 or 58% were treated by private physicians or dentists, while the remaining 27,164 or 42% were under the care of hospitals and dispensaries.

An absolute rule of the Department of Health is that no child shall be referred to an institution for treatment until it has been definitely ascertained by the medical inspector or nurse that the family is unable to pay for the services of a private physician. When it is remembered that the defects for which these children are treated are those for which no treatment has hitherto been received, and except for their discovery by the department would remain neglected, it may readily be seen that the department is turning over each year to the physicians of the city thousands of cases that would not have come to them under other circumstances.

During the three years that this work has been in operation, there has been a definite decrease in the percentage of the number of individual defects found each year, with the exception of defective teeth. The incidence of defective vision has decreased from 13% to 10%; defective nasal breathing, which implies the presence of adenoid growths, has decreased from 18% in 1909 to 11% in 1911, while hypertrophied tonsils show a decrease from 22% to 15% in the same space of time.

This work in the schools, with its control of the contagious disease situation, with the elimination of the school as the main focus of infection; the physical examination of each child as soon as it enters school, before it is allowed to graduate and as nearly as possible every two years in the interim; the instruction of the parents in the character of defects found and in the necessity for treatment and the follow-up work necessary to induce parents to provide treatment or to record their absolute refusal to do so, was performed during 1911 at a per capita cost of \$43. During this same year the per capita cost of the year's schooling in the public schools of New York City was \$43.90.

From a comparison of these figures and facts, it would seem that one had a right to conclude that from either an economic or humanitarian point of view the city is justified in its expenditure by assuring to its future citizens that good health which means virile and useful man and womanhood.

The state has a wider duty in this matter, however, than merely to consider the health of the child in its relation to its school progress. The broad and vital questions which concern the health of the next generation are demanding attention.

In child hygiene, as it is viewed by the New York City Department of Health, is implied the health surroundings and conditions of the child's entire life, not merely the child in relation to any one phase of its development, nor in relation to any one phase of its life in or outside of the home; but the child itself from birth to puberty in relation to all of the circumstances, conditions, incidents which bear upon its life history and welfare. The health of the child to its fifth year

has a most important bearing upon its health between the fifth and fourteenth years, which is the school age, while its health during that period is of equal importance in determining its future welfare. Even during its school life the greater part of its time is spent in the home or under influences which are not within the jurisdiction of the school authorities. Systematic and continuous oversight during the entire life cycle of the child are essential if we are to gain a well-rounded childhood.

In line with this policy the division includes in its activities the control of midwives who, in New York City, report about forty per cent. of the total number of births. The supervision and licensing of these women under the authority of the city, since the organization of the Division of Child Hygiene, has resulted in a marked improvement in their methods and consequently in the health of the women and children under their charge. For six years the department has required that a one per cent. solution of silver nitrate be used by midwives as a prophylactic measure for the prevention of ophthalmia neonatorum. The midwives are required to report every case of sore eyes occurring in their practice, and ophthalmologists are sent in each instance to determine if true ophthalmia neonatorum is present. For many years the statement has been made by competent persons that one-quarter of all persons in the asylums for the blind were there as a result of blindness due to ophthalmia neonatorum. In order to ascertain the result of the activity of the department in this regard, a searching inquiry was made during the past year to determine the present status of these cases. Inquiry was made of every institution for the blind in New York City and throughout the state as to the number of children under observation under five years of age born in New York City and blind from ophthalmia neonatorum. This age limit was taken as covering the time that the department's efforts might reasonably have shown results. Only six cases were reported under this heading from all the institutions. The Committee on the Prevention of Blindness of the New York Association for the Blind stated that their records showed but five or six children of five years or under blind from this disease, a total of twelve cases in the entire state. In this point alone, in decreased human suffering, increased efficiency and economic independence, the gain is so vast that it cannot be compared with the insignificant amount of money expended to produce such results.

The facts in regard to puerperal septicæmia are also worthy of comment. Every death that occurs in New York City from this disease is investigated by the department. If a midwife has been in attendance at any time, even for a period of only a few minutes, the case is listed against her record and is classified as one in which a midwife was in attendance. Notwith-

standing this attitude, which does not in any way give the midwife the benefit of the doubt, it has been found that while approximately 40% of the births were reported by midwives, only 24% of the deaths from puerperal septicæmia can be charged to their account, while physicians reported approximately 60% of the births and were in attendance at the time of confinement in the case of 76% of the women who died from puerperal septicæmia.

I have taken a few isolated instances of the work of the division simply to give an idea of some of the directions in which a distinct value can be demonstrated. No attempt can be made, however, within the limits of this paper to cover the many features of the work which are daily resulting in improved health and physique to the children of the city. The work is an expression of the new relation between boards of health and the public. It is not paternalistic but rather social, economic and humanitarian. It is a definite recognition of the value of educational forces as the predominant feature in modern sanitary methods. Its ultimate object is one that is so broadly humanitarian in its purposes, and so stands for all that is idealistic and valuable in our national life, that we may well agree with Croly who gives expression to the spirit permeating this constructive and far-reaching effort to help children when he says "the only fruitful promise of which the life of any individual or any nation can be possessed is a promise determined by an ideal."

Discussion.

DR. ROSALIE SLAUGHTER MORTON, New York City: The paper which Dr. Baker has presented is so comprehensive in summing up the value of systematic board of health work for child hygiene, that the only point left to emphasize is the fundamental importance of educating the public regarding the value of the municipal control of child hygiene. I have observed that on the programs of the five sections into which the Medical Society of the State of New York has this year been divided, there have been thirty-two papers which bear on this subject; for the whole modern trend toward the prevention of disease is related to child hygiene either directly or through the health of the parents. Comparatively little, however, is accomplished by doctors telling each other how important educational work is, therefore I was especially gratified, Mr. Chairman, that at the meeting of the House of Delegates last Monday evening, you moved an expression of approval of the nation-wide work being carried forward by the American Medical Association for the education of the laity under their Committee for Public Health Education among Women. One of the most valuable parts of this work has been assisting in educating mothers of all classes to realize the value to them and to the community, of school inspection, vaccination, con-

trol of contagious diseases, prevention of eye strain, etc. The excellent work of the board of health is often handicapped by stupid indifference or ignorant opposition; the committee has therefore, as a practical piece of coöperation endeavored to widely distribute through all organized bodies of women knowledge which rouses their sense of responsibility to assist in upholding the municipal control of child hygiene.

REAL THINGS IN A HEALTH OFFICER'S LIFE.*

By R. L. CROCKETT, M.D.,

ONEIDA, N. Y.

THE office of health officer has in the past been too often more ornamental than useful, but we are striving to increase the usefulness without impairing the ornamental qualities. Medical science is rapidly passing out of the age of superstition and is standing more and more on a sound scientific basis. The researches of the years are bearing fruit more and more abundantly, and we are seeing with a clearer vision the ways and means of dealing with disease as its causes and modes of transmission are understood more perfectly. With only our present knowledge properly applied, we could make the names of many diseases which are yearly taking a heavy toll from our population, merely an unpleasant memory. The knowledge is at hand, but it must be applied properly and there is where a large part of the work of the next generation along that line is needed. And, you all know where the work will ultimately fall—on the health officer.

Often the first thing considered in the appointment of a health officer is the politics of the physician—then, what influence he has, or what good turn he may have done the "powers that be." Now, this is not ordinarily due to any really vicious intent on the part of the appointing powers, but rather through a failure to comprehend that we want the best man that we can get for the position as the office requires ability, a knowledge of modern sanitary methods, and, what is of greater importance, the desire to know more.

A couple of years ago Mayor Duryea of Schenectady, in organizing a conference of mayors and city officials, directed their attention to these subjects with what seemed to me a great deal of benefit, as I heard more than one remark afterward that they had had no idea before of the work that a sanitary officer had to do. In many places there has been the tendency to belittle the work of the health department and crowd it into a subordinate place.

Now, perhaps, I am mistaken, but it seems to

me that such conditions are not only deplorable, but unnecessary.

If the sanitary officers in particular, and the medical profession in general, will get after the governing powers and prove to them conclusively that a well-supplied sanitary department is of vital importance to the welfare of the municipality—as it certainly is—and that, moreover, an efficient sanitary department is one of the best investments from a financial point of view that the municipality can make—as can be proved—in the majority of cases they will find that those who are in power are ready to meet them half way.

Politics have no place in any health department, either city or country, and until they are eliminated, the efficiency of the department will be greatly impaired. If it is necessary to give certain people jobs or patronage because of their services to the party, it always happens that such services or supplies cost more than if these things were not considered.

Another thing that prevents the greatest efficiency of the department is the very small salaries or fees which we obtain for sanitary work of any kind. It is not right that medical men should work for the public for such meager pay as they now receive. There is hardly a man engaged in public health work, from the commissioner down, who is receiving anything like adequate remuneration.

The office of State Commissioner of Health is fully as important to the people of the state and demands as much ability to carry on its work as that of a public utilities commissioner, but there is some difference in the salary—and the difference is not in favor of the doctor either. A state that can pay 101 millions of dollars for a barge canal is certainly able to do a great deal more than it does to preserve the lives and health of its citizens.

Even in our own profession work of this sort is not given anywhere near its true value—men who show their realization of the value of their own work as a surgeon, or consultant, by the size of their fees, expect a man to do the bacteriological work for a city of anywhere from 100,000 to 500,000 population for from \$1,200 to \$1,800 a year—work which demands as much skill and ability as any other branch of medicine and work on which depends the lives of more people.

I firmly believe that we are in a large measure to blame for these conditions ourselves. We do not place the proper value on our services that we should, and, besides that, we are altogether too apt to stand still and allow whoever wishes to shove us out of the way.

The health department should be subordinate to no other department, and should be controlled by medical men, and the salaries of its officials should be equal to those of the officials of any other department.

* Read at the Annual Meeting of the New York State Health Officers' Association, at New York City, October 24, 1911.

In some cases, especially in the rural districts, and, in fact, any place where the health officer has to do his own inspection work, the remuneration should be by fees and in no case should the fee for the service be less than the physician would charge for services requiring the same time and skill if rendered to individuals in the course of his private practice.

If the health officer is any good he should be kept in office long enough to learn how to handle his department properly; and not fired out to make room for somebody else who don't know anything about it. It takes at least two years for a man to really learn how to do things in such a position, and his usefulness increases for some time.

One of the most important, if not the most important, qualification that a health officer can have is tact. Tact in getting along with his health board, with the other physicians in the community and with the community in general. In the handling of contagious and infectious diseases, which is the most important part of a health officer's duties, this quality comes decidedly into play. He should make the attending physician in the case feel that he is there to help him—if possible he should make his inspection of the case when the attending physician can be present—and he should make a real inspection, should see the patient and know the condition for himself, and not just go to the house and tack up a card on somebody else's say so, without knowing anything about the matter himself.

He should make the family of the patient feel that the measures he is taking are for their good and the good of the community, and should get their confidence and co-operation in carrying out these measures. Only by the co-operation of the health officer and the attending physician can we prevent the spread of contagion.

And we have found that by this means it can be prevented. During the last year, although we had quite a large number of cases of scarlatina and diphtheria, which were brought in from other localities, in but one case did the disease spread beyond the family where it first appeared, and that case moved out of town without having been seen by a physician. In addition to that, in our immediate neighborhood on both sides of us there occurred during the summer a large number of cases of typhoid, and a number were brought into the city for treatment, yet in spite of that we had no infection arising from these cases. It may be all luck, but I am inclined to ascribe part of it to the co-operation of the medical profession and the health department.

The more the physicians of a community get together and talk things over, and get better acquainted, the better for all concerned. We have found our local medical club, meeting at the homes of our members every month, without any formality, to discuss subjects of interest, to be a great factor in providing good feeling among

the profession, and in formulating policies for the better treatment of our patients and the better sanitation of our city. A few talks by those engaged in sanitary work in a gathering of that sort, will do more good than a dozen formal orders and announcements.

Neither the general public nor the medical profession has realized how important a subject preventative medicine is, or how much can be accomplished by sanitary measures, and it is education along that line that is needed in order to put preventative medicine in the place where it belongs, and to bring about the eradication of preventable diseases.

If the general public really understood the method of transmission of typhoid, for example, and how the disease could be completely stamped out by appropriate measures, there would be a general demand for such action, and a willingness to do anything necessary to that end. It is to an educated and enlightened public that we must look for co-operation and support in such undertakings, and the brunt of the work of education falls on the health officer. To this end he must be a practical man, one whose opinions are respected in the community; he must be an honest man—one whose word is taken by his neighbors as the truth; he must be a man of sufficient education and ability to grasp new ideas in sanitation, and to be able to sift out the real grain of facts from the chaff of fads and fancies, with which it is so often mixed.

With men of this type in charge of our health department, and the importance of the work impressed on the community, the office will be properly appreciated; those who do the work will have sufficient remuneration and preventable diseases will really be prevented.

CO-OPERATION.*

By C. F. ABBOTT, M.D.,

ELMIRA, N. Y.

IN selecting a topic for my paper I wished to bring up a subject I have never heard discussed in this Society, but one that concerns us all. Not that I do not appreciate the importance of discussing disease but there are other things in physicians' experiences quite as important.

Several years ago in getting the views of different men as to the best way to practice medicine successfully from a financial point of view, the editor of a Western medical journal advocated more men locating in the country. But all country practice is not profitable.

The editor of an eastern medical journal declared that in time we would all be specialists and he urged all physicians to take up and prac-

* Read before the Medical Society of the County of Chemung, June 20, 1911.

tice a specialty. This view does not suit everybody.

If a business man saw his business going to a competitor he would study the situation, find the reason, and remedy the conditions causing it. What are we doing to prevent our business going to the drugless healers and faddists who apply practically one treatment to all diseases and ailments? It is said on good authority that there are in this country 28,300 drugless healers with a following of 17,600,000 people.

What are we doing to prevent the enormous consumption of patent medicines for which it is said an average of \$2,000 per physician per year is paid?

One remedy for this startling condition—for in our everyday work we do not grasp the extent of the matter—is newspaper publicity, as Dr. Frank Hallock, retiring president of the Connecticut Medical Society, advocated in a paper recently. He urged that the readers of newspapers be given sources of medical information other than the perverted statements of advertisements. The Colorado State Society and other state societies are working along these lines now I believe.

The term "Charity" covers a "multitude of sins" in the medical profession. I would not complain of true need that receives our willing service, but of unnecessary charity and of that so-called charity that allows well-to-do people to take advantage of dispensary practice in the big cities. Do you know that the charity abuse in Chicago alone amounts to an average of \$2,500 per year for every physician in the city? On the other hand I am told by a physician connected with the circulation department of the *Journal of the American Medical Association* that a canvass of the physicians of Chicago showed an average income of about \$725 per year. Why should this condition prevail?

I am willing to do my share of needed charity work—and do it—but I would very much like to have some choice in the matter. This brings up the subject of the "dead beat." I have no statistics to show the extent of this condition but if you will look over your accounts you will find a nice little income tied up in "dead beat" accounts.

This is a difficulty that no one man nor a few can cope with successfully. One man may reduce his list of "dead beats" to a minimum, but why not all get together to reduce the total number of "dead beats" to a minimum.

I believe if you make a man pay *you* he will employ *you* instead of going to your competitor and "knocking" you.

It has always seemed heartless to refuse to treat the worthy dependents of a "dead beat" just to punish the "dead beat" himself. I would like very much to punish him in some other way.

Scientific management is discussed on all sides today. If it is not scientific farming it may be scientific management of railways or of office

work or even of shop work. The conviction has long possessed me that physicians are not scientific in managing the business side of their profession—and it has its business side.

The Vedas—the Sacred writings of India—show that medicine was early considered a business as well as an art.

"The practice of medicine is a science, an art, and a business" some one has aptly said.

An old college professor is quoted as saying "Medicine is a noble profession but a damn poor business."

One writer says "Our unit system of doing business is an unmixed evil. It increases our fixed charges, causes rabid competition and makes enemies among the very people who should be our friends. Our only salvation in medicine is in co-operative work. The physicians in each community must unite and secure laboratory knowledge and facilities and turn guesswork into certainty.

"If physicians would organize and co-operate with each other they could increase their efficiency in many things. Every member of a co-operative firm should be a general practitioner with some specialty. All should co-operate with each member of the firm in diagnosis and do it cheerfully. The firm could maintain one or more laboratories which would be under the direction of some member of the combination."

Co-operation seems to be the basis of most successful ventures. It is true all co-operative ventures have not been brilliant successes but the grocers and coal dealers in this city appear to have very effective co-operative associations and some of the druggists had a co-operative buying club that seemed to work well.

It is said that all the hospitals of Toronto, Canada, are going to purchase all their supplies through one agent. This is a plan advocated by Dr. Goldwater, Superintendent of Mt. Sinai Hospital of New York.

As the result of the formation of a hospital association in a Western town a fine hospital was built. The People's Hospital of Sayre, Pa., is a co-operative affair as you all know.

Several physicians in a Western town formed a co-operative firm each practicing his favorite branch of medicine as well as general medicine. In connection with their offices they had a lounging room for themselves and visiting physicians. They provided for a vacation for each member of the firm once a year, and if one of them wished to take post-graduate work his practice was looked after by the other members of the firm.

In China it is said physicians combine. Especially in Hong Kong practically all English speaking physicians combine so that the firm consists of an internist, a surgeon, and some other specialist.

Several physicians in Western Pennsylvania formed the Red Bank Physicians' Protective Association for the better handling of the conditions

confronting them, the worst of these being a great lack of uniformity in fees, and the "dead beat." The association has regulated the fees satisfactorily and the members have been much gratified to find "dead beats" of long standing paying their accounts.

In some cities physicians have a professional building, others occupy the same offices at different hours during the day. In some cases they have separate offices but maintain a common waiting room presided over by a girl who operates the telephone exchange in the waiting room. I am told all these plans are operated in Chicago.

I mention these instances to show that co-operation is successful in many cases and therefore is practical.

A combination that would provide for at least one man in the office at all times to attend emergency cases would be filling a want, as I have been told many times by patients that every physician was out when they were the most needed for some emergency case.

While conditions here are very satisfactory compared with those elsewhere I think these could be improved upon somewhat. For instance the present fee table is quite adequate if rigidly followed using the present fees as a minimum. It seems to me that double fees should be allowed for night calls in the office as well as to the patient's home. In some places with fees the same as ours \$2 is charged for making a house visit during office hours.

I think a fee should be charged for filling out insurance papers for disability or death. In a place read of the physicians devised a uniform blank, had them printed at their own expense and furnished them properly filled out at a charge of fifty cents per certificate.

A charge should be made for dispensing medicines, especially renewals.

Only by co-operating can we destroy lodge, contract, and cheap insurance examining practices for I have been told by physicians that they would drop their contracts in a minute if they could feel sure that a colleague would not snap them up. I have refused a fine lodge practice only to have it taken in a very short time by one of my friends in the profession.

By co-operation we could better ourselves by increasing our individual incomes and we could better the public by having more time and money to give to the public questions we are expected to solve.

Of course many physicians have become independent or are originally independent financially and can do good public work, but the rank and file are not able to and the public loses the services of good capable men. If we are to have a contented prosperous profession it must be by co-operation on the part of all in the profession.

The Medical Society of the State of New York

MEETING OF THE COUNCIL.

A regular meeting of the Council of the Medical Society of the State of New York was held in the rooms of the Society, 17 West 43rd Street, New York City, May 3rd, 1912, at 2.30 P. M. Dr. John F. W. Whitbeck, President, in the chair. Dr. Wisner R. Townsend, Secretary.

The meeting was called to order by the President and on roll call the following answered to their names:

John F. W. Whitbeck, William F. Campbell, Walter B. Chase, Henry A. Eastman, Fred G. Fielding, W. Stanton Gleason, Daniel B. Hardenbergh, Thomas J. Harris, John B. Harvie, R. Paul Higgins, Alexander Lambert, Frederick M. Miller, Wesley T. Mulligan, Herbert B. Smith, Wisner R. Townsend, and Joshua M. Van Cott.

The minutes of the last meeting (see JOURNAL, page 275) were read and approved.

Dr. T. J. Harris, Chairman of the Committee on Scientific Work nominated as members of the Committee Drs. Henry L. Elsner and Parker Syms.

On motion duly seconded and carried they were elected members of the Committee.

Dr. R. P. Bush, Chairman of the Committee on Legislation sent a written communication nominating as members of the Committee Drs. Lewis K. Neff and Charles R. Barber.

On motion duly seconded and carried they were elected members of the Committee.

Dr. J. M. Van Cott, Chairman of the Committee on Public Health nominated as members of the Committee Drs. Charles Stover and Allen A. Jones.

On motion duly seconded and carried they were elected members of the Committee.

Dr. Wesley T. Mulligan, Chairman of the Committee on Arrangements nominated as members of the Committee Drs. Myron B. Palmer, Ralph R. Fitch, Albert C. Snell, Charles O. Boswell, Bradford A. Richards, Owen E. Jones and Carl A. Huber.

On motion duly seconded and carried they were elected members of the Committee.

The Chair suggested that at the next annual meeting the scientific session be divided into Sections on Medicine; Surgery; Eye, Ear, Nose and Throat; Pediatrics; Obstetrics and Gynecology.

Moved by Dr. Harris, seconded and carried, that the recommendation be carried out.

The Council then proceeded to nominate and elect chairmen and secretaries of the sections. The following were elected:

Section on Medicine—DeLancey Rochester, Chairman, Buffalo; Norman K. MacLeod, Secretary, Buffalo.

Section on Surgery—Martin B. Tinker, Chairman, Ithaca; Willis E. Bowen, Secretary, Rochester.

Section on Eye, Ear, Nose and Throat—John E. Weeks, Chairman, New York City; Thomas H. Halsted, Secretary, Syracuse.

Section on Pediatrics—Henry L. K. Shaw, Chairman, Albany; Thomas S. Southworth, Secretary, New York City.

Section on Obstetrics and Gynecology—William M. Brown, Chairman, Rochester; Ross McPherson, Secretary, New York City.

Moved, seconded and carried, that at the meeting in 1913 the Scientific Session begin on Tuesday afternoon and extend through Wednesday and Thursday, with the request that the Committee on Scientific Work endeavor to close the meeting by Thursday noon.

Moved, seconded and carried, that the time, length and character of the public meetings be left to the President and the Committee on Scientific Work with power.

Moved, seconded and carried that the request of Dr. John B. Walker—that a committee be appointed to

consider the subject of fractures—be referred to the Section on Surgery with power.

The President announced the following committees: Committee on Aged and Infirm Members—Drs. Henry R. Hopkins, Frank Overton, John O. Roe, Heinrich Stern, and Charles D. Young.

Committee on Revision of By-Laws—Egbert Le Fevre, Wesley T. Mulligan, Wendell C. Phillips, Wisner R. Townsend, Albert Vander Veer.

The Treasurer announced that the Committee on Finance had held a meeting and made appropriations for the following year, and that the estimated expenses of the Society would practically equal the income.

The Secretary read the following resolutions which were passed by the House of Delegates at the Annual Meeting held in Albany, April 15th:

"Whereas, we consider it impracticable and impossible for the averaged sized county medical society to secure the enforcement of the laws regulating the practice of medicine, therefore be it

"Resolved, That our delegates to the State Society be directed to bring this matter to the attention of the House of Delegates, with the intent that the enforcement of such laws be assumed by the State Society.

"Resolved, That the Secretary send copies of these resolutions to each of the County Medical Societies in this State."

After consultation with the attorney and on receipt of a statement from the Treasurer, the following resolution was moved, seconded and carried:

"Resolved, That the Council regrets its inability to put into effect the above resolutions presented by the Medical Society of the County of Dutchess and passed by the House of Delegates at the Annual Meeting, held in Albany, April 15th, owing to the fact that to do this work in all the different counties of the State would entail an expense in excess of the present revenues of the Society and that the Council has no authority or means of increasing the revenues."

The Secretary called the attention of the Council to the necessity for increased work in the county societies in order that increase in membership may follow, and also spoke of the necessity for assistance in securing a National Bureau of Health and for assisting the Committee on Legislation and the Committee on Experimental Medicine in their work.

There being no further business to come before the meeting, it adjourned *sine die* at 4 P. M.

WISNER R. TOWNSEND, *Secretary*.

MEETING OF THE CENSORS.

A meeting of the Board of Censors of the Medical Society of the State of New York was held at the rooms of the Society, 17 West 43rd Street, on May 3rd, 1912, at 10 A. M., to hear the appeal of Dr. Robert Kunitzer from the decision of expulsion by the Medical Society of the County of New York. Dr. John F. W. Whitbeck, President, in the chair. Dr. Wisner R. Townsend, Secretary.

On roll call the following answered to their names: John F. W. Whitbeck, Walter B. Chase, Henry A. Eastman, Fred G. Fielding, Daniel B. Hardenbergh, John B. Harvie, Frederick M. Miller, Herbert B. Smith, and Wisner R. Townsend.

Mr. A. C. Vandiver appeared for the Medical Society of the County of New York, Mr. A. S. Gilbert for Dr. Kunitzer, and Mr. James Taylor Lewis for the State Society.

On motion duly seconded and carried, the Censors went into executive session, and when the meeting was resumed the President announced that it had been decided that Mr. Lewis should conduct the hearing for the Censors.

Miss Siegeltuch was designated as official stenographer.

Dr. Townsend, on his own request was excused from

voting as he was a member of the County Society which had tried Dr. Kunitzer.

The following witnesses appeared for Dr. Kunitzer: Mr. C. F. Westrom, Mr. O. Lowenson, Drs. H. Jarecky, F. H. Mosler, L. Kunz, E. L. Spitzer, S. W. Schapira, F. K. Schoenberger, M. Rosenthal, S. L. Spiegelberg, J. Moran, A. J. Herzig, L. Friedman, E. K. Browd, J. Guttman, M. Michailovsky, M. I. Blank, and J. Weiss.

The Censors adjourned at 1 P. M.

Session was resumed at 4.30. At 6.30 the County Society, through its attorney, Mr. Vandiver, decided to submit no evidence and the hearing was then declared closed. Mr. Gilbert summed up for the appellant; Mr. Vandiver for the Medical Society of the County of New York. The Censors went into executive session, and at 8 P. M. the following report was rendered:

"The Censors determine that the vote in regard to the expulsion of Dr. Kunitzer according to the evidence introduced was not properly counted and announced since no adequate means were taken to ascertain the number of members in good standing in the Medical Society of the County of New York, in attendance at the meeting.

Signed,

JOHN F. W. WHITBECK
DANIEL B. HARDENBERGH
HERBERT B. SMITH
JOHN BRUCE HARVIE
FRED G. FIELDING
FREDERICK M. MILLER
WALTER B. CHASE."

Dr. Eastman took part in the discussions but declined to sign the report.

On motion, duly seconded and carried, the Censors adjourned *sine die*.

WISNER R. TOWNSEND, *Secretary*.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF DUTCHESS.

REGULAR MEETING, AT POUGHKEEPSIE, APRIL 10, 1912.

The following amendments to the By-Laws were proposed and accepted:

Chapter III. Sec. 1. After the word Secretary, add Associate Secretary.

Chapter IV. After Sec. 3, add Sec. 3—A. Associate Secretary.

The Associate Secretary shall assist the Secretary in the discharge of his duties, and in the event of his death, removal or incapacity or refusal to act, shall succeed him.

SCIENTIFIC SESSION.

"Report of Public Health Committee with Special Reference to Mortality Under the Age of 5 Years in Poughkeepsie and Dutchess County," J. E. Sadlier, M.D., Poughkeepsie.

"Control of the Common Contagious Diseases," N. Borst, M.D., Poughkeepsie.

"Laws on Tuberculosis," Charles S. Prest, M.D., State Department of Health, Waterford.

CORTLAND COUNTY MEDICAL SOCIETY and TOMPKINS COUNTY MEDICAL SOCIETY.

JOINT MEETING AT FREVILLE, MAY 23, 1912.

SCIENTIFIC SESSION.

"The Unusual in Medicine," S. J. Sornberger, M.D., Cortland.

"The Oro-Pharynx and the Physician's Responsibility," F. D. Reese, M.D., Cortland.

"Infections of the Mouth and Throat and Their Sequelæ," C. D. Ver Nooy, M.D., Cortland.

"Cæsarian Section with Recovery of Mother and Child," M. M. Lucid, M.D., Cortland.

A dinner was served at 5.30 P.M. at the George Junior Republic Inn.

MEDICAL SOCIETY OF THE COUNTY OF WASHINGTON.

SEMI-ANNUAL MEETING, AT WHITEHALL, MAY 14, 1912.

The report of the Comitia Minora was read and approved.

SCIENTIFIC SESSION.

"Case of Extra-uterine Pregnancy," W. L. Munson, M.D., Granville.

"Etiology and Symptoms of Myocardial Degeneration," A. E. Falkenbury, M.D., Whitehall.

"Preparation and Uses of the Antitoxins Prepared and Sent Out by the State," Wm. S. Magill, M.D., State Hygienic Laboratory.

"Three Cases of Tetanus Successfully Treated with Antitoxin," G. S. Towne, M.D., Saratoga Springs.

MEDICAL SOCIETY OF THE COUNTY OF CHEMUNG.

REGULAR MEETING, MARCH 19, 1912.

SCIENTIFIC SESSION.

"Symposium on Pneumonia. Etiology," J. L. Herrick, M.D., Elmira.

"Relation of Ear, Nose and Throat," G. M. Case, M.D., Elmira.

"Diagnosis," F. E. Woodhouse, M.D., Elmira.

"Morbid Anatomy," L. D. Mottran, M.D., Elmira.

"Complications," W. C. Byrne, M.D., Elmira.

"Prognosis and Treatment," A. H. Baker, M.D., Elmira.

MEDICAL SOCIETY OF THE COUNTY OF LIVINGSTON.

REGULAR MEETING, AT SONYEA, MAY 7, 1912.

SCIENTIFIC SESSION.

"Neurological Examination," E. A. Sharp, M.D., Buffalo.

"Duodenal Ulcers," E. R. McGuire, M.D., Buffalo.

"Fractures," Ward Plummer, M.D., Buffalo.

"Presentation of a Heart Case," W. N. Trader, M.D., Sonyea.

"Diphtheria," B. F. Andrews, M.D., Sonyea.

"Typhoid Prophylaxis," J. F. Munson, M.D., Sonyea.

MEDICAL SOCIETY OF THE COUNTY OF MONROE.

REGULAR MEETING, MAY 21, 1912.

SCIENTIFIC SESSION.

"Surgery and the Patient," H. Prince, M.D., Ithaca.

"The Importance of Blood Examinations in Practice," John M. Swan, M.D., Watkins.

"New Laws Relating to the Mentally Defective," E. H. Howard, M.D., Rochester.

MEDICAL SOCIETY OF THE COUNTY OF CLINTON.

SEMI-ANNUAL MEETING, MAY 21, 1912.

SCIENTIFIC PROGRAM.

"Salvarsan," R. W. Holmes, M.D., U. S. Army.

"Diphtheria Antitoxin," A. W. Fairbank, M.D., Chazy.

"The Secondary Effects of Chronic Cholangitis," L. G. Barton, M.D., Willsboro.

"Therapeutic Accuracy," M. D. Briggs, M.D., Cham-

MEDICAL SOCIETY OF THE COUNTY OF SCHENECTADY.

REGULAR MEETING, MAY 14, 1912.

SCIENTIFIC PROGRAM.

"Report of a Case of Stills Disease," H. A. Kurth, M.D., Schenectady.

"Pathology of Stills Disease," E. MacD. Stanton, M.D., Schenectady.

"The Treatment of Chronic Gastro-Intestinal Disorders in Childhood," F. Vander Bogert, M.D., Schenectady.

MEDICAL SOCIETY OF THE COUNTY OF ERIE.

REGULAR MEETING AT BUFFALO, APRIL 22, 1912.

President Thomas H. McKee called the meeting to order at 8.30 P. M. Secretary F. C. Gram read the minutes of the regular meeting held February 19th, 1912, and the minutes of the Council meetings held March 4th, March 9th and April 1st, 1912, all of which were approved.

Five new members were elected, and one reinstated. Dr. Bonnar, Chairman of the Board of Censors made a brief verbal report.

Dr. Wm. H. Thornton, Chairman of the Special Committee appointed for the purpose of devising means for the better collection of delinquent accounts, outlined the work thus far and, on his motion, the committee was authorized to expend a sum not to exceed twenty dollars (\$20.00) in promoting its work.

Dr. Thornton also reported for the delegates to the recent meeting of the State Society.

Dr. F. S. Crego called the attention of the Society to the State law which prohibits the keeping of insane patients at Police Stations.

He, therefore, moved that the President appoint a committee of five for the purpose of conferring with the Health Commissioner and other proper authorities, with a view to establishing a suitable psychopathic ward in this city.

The motion was carried and the President appointed Drs. Crego, Matzinger, Sharp, Putnam and Nairn as such committee.

President McKee called attention to the system of cleaning street cars, by which conductors, on some lines, are compelled to sweep their cars at the end of the line instead of having them cleaned in the car barns. This creates a nuisance which the passengers are compelled to suffer. On motion of Dr. Lytle, this matter was referred to the Committee on Public Health.

SCIENTIFIC SESSION.

Dr. Hartwig presented a patient, a Polish laborer, about 40 years old, on whom violent spells of vomiting could be incited by pressure on a certain part on the side of his neck.

"Malposition of the Uterus During the Puerperium," F. C. Goldsborough, M.D., Buffalo.

"Differential Diagnosis of Hæmaturia," D. E. Wheeler, M.D., Buffalo.

"Preliminary Report on Conservation in the Treatment of Prostatic Hypertrophy," N. W. Wilson, M.D., Buffalo.

"Treatment of Compound Fractures," Thew Wright, M.D., Buffalo.

MEDICAL SOCIETY OF THE COUNTY OF ALLEGANY.

REGULAR MEETING AT FRIENDSHIP, APRIL 11, 1912.

SCIENTIFIC SESSION.

"Bacterins and Sera," H. F. Gillette, M.D., Cuba.

"Finance," F. H. Van Orsdale, M.D., Belmont.

MEDICAL SOCIETY OF THE COUNTY OF
WARREN.SEMI-ANNUAL MEETING, AT GLENS FALLS, APRIL 10, 1912.
SCIENTIFIC SESSION.

"Hyperthyroidism," B. J. Singleton, M.D., Glens Falls.

"Control and Treatment of Arterial Hypertension," A. F. Mosher, M.D., Glens Falls.

MEDICAL SOCIETY OF THE COUNTY OF
RENSSELAER.

REGULAR MEETING, MAY 13, 1912.

SCIENTIFIC PROGRAM.

"A Synopsis of Results Obtained by Comparatively Recent Developments in the Field of Applied Therapeutics," H. Travell, M.D., New York City.

"Saratoga and Her Mineral Springs," D. C. Moriarta, M.D., Saratoga.

"The X-Ray as an Aid in Gastro-Enteric Diagnosis," Andrew MacFarlane, M.D., Albany and Arthur Holding, M.D., New York City.

"A Plea for Better Diagnosis," J. H. Collins, M.D., Schenectady.

SCHUYLER COUNTY MEDICAL SOCIETY.

ANNUAL MEETING, AT GLEN SPRINGS, MAY 14, 1912.

SCIENTIFIC PROGRAM.

Papers were read by Drs. A. A. Jones, M.D., of Buffalo, and Nathan Jacobson, Professor of Surgery, Syracuse University.

Discussion of Dr. Jones' paper was opened by C. J. R. Jennings, M.D., of Elmira, and Dr. Arthur Booth of Elmira opened the discussion of Dr. Jacobson's paper.

MEDICAL SOCIETY OF THE COUNTY OF
GENESEE.

REGULAR MEETING, AT BATAVIA, APRIL 3, 1912.

Dr. J. B. Miller presented a report on the small fees paid by the Board of Supervisors for autopsies which was received and accepted by the Society.

SCIENTIFIC SESSION.

"Gastric Symptoms," T. H. McKee, M.D., Buffalo.

"X-Ray Aspects of Gastric Symptoms," Leonard Reu, M.D., Buffalo.

"Control of Infectious Disease," J. W. Le Seur, M.D., Batavia.

BOOKS RECEIVED.

COMMON DISORDERS AND DISEASES OF CHILDHOOD. By George Frederic Still, M.A., M.D. (Cantab.), F.R.C.P. (Lond.). Professor of Diseases of Children, King's College, London; Physician for Diseases of Children, King's College Hospital; Physician to the Hospital for Sick Children, Great Ormond Street; Honorary Member of the American Pediatric Society. Second edition. London. Henry Frowde, Oxford University Press. Hodder & Stoughton, Warwick Square, E.C. 1912. Price, \$5.50.

THE COLLECTED WORKS OF CHRISTIAN FENGER, M.D. Edited by Ludvig Hektoen, M.D., Professor of Pathology at Rush Medical College. Two octavo volumes averaging 525 pages each, illustrated. Philadelphia and London: W. B. Sanders Company. 1912. Per set: Cloth, \$15.00 net; half morocco, \$18.00 net.

SURGICAL AFTER-TREATMENT. By L. R. G. Crandon, M.D., Assistant in Surgery at Harvard Medical School, and Albert Ehrenfried, M.D., Assistant in Anatomy at Harvard Medical School. Second edition, practically rewritten. Octavo of 831 pages, with

264 original illustrations. Philadelphia and London: W. B. Saunders Company. 1912. Cloth, \$6.00 net; half morocco, \$7.50 net.

PSYCHOTHERAPY, including the History of the Use of Mental Influence, Directly and Indirectly, in Healing and in the Principles for the Application of Energies Derived from the Mind to the Treatment of Disease. By James J. Walsh, M.D., Dean and Professor of Nervous Diseases and of the History of Medicine at Fordham University School of Medicine, and of Physiological Psychology at the Cathedral College, New York. 740 pages, illustrated. Cloth, \$6.00 net. D. Appleton & Company, New York, London.

INTERNATIONAL CLINICS. A quarterly of illustrated clinical lectures and especially prepared original articles on Treatment, Medicine, Surgery, Neurology, Pædiatrics, Obstetrics, Gynæcology, Orthopædics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, U. S. A., with the collaboration of Wm. Osler, M.D., Oxford, John H. Musser, M.D., Philadelphia, A. McPhedran, M.D., Toronto, Frank Billings, M.D., Chicago, Charles H. Mayo, M.D., Rochester, Thos. H. Rotch, M.D., Boston, John G. Clark, M.D., Philadelphia, James J. Walsh, M.D., New York, J. W. Ballantyne, M.D., Edinburgh, John Harold, M.D., London, Richard Kretz, M.D., Vienna. Regular correspondents in Montreal, London, Paris, Berlin, Vienna, Leipsic, Brussels and Carlsbad. Volume 1. Twenty-second series, 1912. Philadelphia and London. J. B. Lippincott Co. 1912. Price, \$2.00.

IMMUNITY. Methods of Diagnosis and Therapy, and Their practical Application, by Dr. Julius Citron, Assistant at the University Clinic of Berlin, II Medical Division, translated from the German and edited by A. L. Garbat, M.D., Assistant Pathologist, German Hospital, New York. 27 illustrations, 2 colored plates and 8 charts. Philadelphia. P. Blakiston's Son & Co., 1012 Walnut Street. 1912. Price, \$3.00 net.

A POCKET FORMULARY. By E. Quin Thornton, M.D., Assistant Professor of Materia Medica in The Jefferson Medical College, Philadelphia. Tenth edition, revised. Lea & Febiger. Philadelphia and New York. Price \$1.50, net.

TRANSACTIONS OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA. Third series. Volume 33. Philadelphia. Printed for the College. 1911.

DEATHS.

J. N. BEEKMAN, M.D., Lakewood, N. J., died April 26, 1912.

W. S. CHEESMAN, M.D., Auburn, died May 3, 1912.

C. F. CLOWE, M.D., Schenectady, died April 29, 1912.

E. B. HORTON, M.D., Niagara Falls, died May 6, 1912.

VELONA A. MARSHALL, M.D., Moriah, died May, 1912.

W. M. WELLS, M.D., Fulton, died March 30, 1912.

A. LENORA WHITE, M.D., New York City, died May 7, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

ALGERNON THOMAS BRISTOW, M.D., Editor

Business and Editorial Offices: 17 West 43d Street, New York, U. S. A.

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Vol. XII.

JULY, 1912

No. 7

EDITORIAL DEPARTMENT

FOREWORD TO THE MEMBERS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

A T a recent conference of your Committee on Scientific Work and the President, matters of special and general importance concerning the next annual meeting of the State Society were carefully considered.

It seemed to your representatives to be the consensus of opinion in the Society that a division of the Scientific Work into sections had been shown in the convention of this year, to be wise and that the results had been successful and highly gratifying.

The Council decided that with some modifications and substitutions the sectional work should be continued. Whether the number of sections shall be limited to three or extended to four or more, it was the judgment of the Council that time and experience should determine.

At the meeting to be held in Rochester, April 28th to May 1st, 1913, the Council authorized the organization of five sections, *viz.*, medicine; surgery; eye, ear, nose and throat; pediatrics; obstetrics and gynecology.

At the conference of the Committee on Scientific Work, it was voted to have a general session of the Society at 11 o'clock Tuesday morning, April 29th, when the president would briefly address the meeting, the mayor would extend a welcome to the Society to the city of Rochester, and that there should be a discourse on some surgical topic. It was further determined that there would be sessions of three hours in each section Tuesday afternoon, Wednesday morning and afternoon and Thursday morning, an adjournment of the convention being taken after the Thursday forenoon sessions.

The whole number of papers in any section shall be limited to twenty-four, not to exceed twenty minutes in length, those of ten to

fifteen minutes being preferred, thus leaving ample time for discussion. The openers of the discussions will be allowed ten minutes, the other participants being limited to five minutes each.

The chairmen were earnestly requested to caution the essayists as to the length of their papers, advising them if they wish to write at greater length than twenty minutes, that they should prepare a separate abstract for reading and present the full length paper for publication.

The chairmen were urged to begin their sessions punctually at the appointed hours,—9 A. M. and 2 P. M.

There is to be a mass meeting Wednesday evening, when some address of general interest will be provided for the public.

It was voted that the plan for reporting the discussions at the last Albany meeting should be followed, and that each disputant be handed a pencil and pad and be requested to write down his own remarks.

The Section Chairmen were requested to prepare mailing lists for those interested in the work of their sections: that the July issue of the State Journal should contain a statement from the Committee on Scientific Work regarding the time and place of meeting, with an invitation to the members of the Society, who desire to read papers, to send their titles at once to the respective section chairmen: that as soon as possible a personal invitation shall be sent out by the chairmen of the several sections: that the naming of a specified number of essayists should be left to the judgment of the chairmen.

On recapitulation it will be obvious that your committee is making every effort to have an attractive, instructive convention of the State Society, with such scientific subjects selected as shall present the most important topics in the most desirable manner for information and for general discussion. In conclusion, permit the

president to earnestly request your active co-operation in promoting all of the interests of the State Society. JOHN F. W. WHITBECK.

ANNOUNCEMENT.

The 107th annual meeting of the Medical Society of the State of New York will be held in Rochester April 29 to May 1, 1913. The plan of section meetings pursued so successfully at the recent meeting in Albany will be followed.

The several sections with their officers are as follows:

Section on Medicine: Chairman—DeLancey Rochester, M.D., 469 Franklin St., Buffalo, N. Y.; Secretary—Norman K. MacLeod, M.D., 448 Delaware Ave., Buffalo, N. Y.

Section on Surgery: Chairman—Martin B. Tinker, M.D., 105 N. Aurora St., Ithaca, N. Y.; Secretary—Willis E. Bowen, M.D., 827 Main St., E., Rochester, N. Y.

Section on Nose, Ear and Throat: Chairman—John E. Weeks, M.D., 46 East 57th St., N. Y. City; Secretary—Thomas H. Halsted, M.D., 831 University Block, Syracuse, N. Y.

Section on Gynecology and Obstetrics: Chairman—William M. Brown, M.D., 666 East Ave., Rochester, N. Y.; Secretary—Ross McPherson, M.D., 20 West 50th St., N. Y. City.

Section on Pediatrics: Chairman—H. L. K. Shaw, M.D., 361 State St., Albany, N. Y.; Secretary—Thomas S. Southworth, M.D., 807 Madison Ave., N. Y. City.

In order to permit of more time for discussion it has been determined to limit the number of papers. Members desiring to read papers are accordingly requested to communicate with the chairmen of the several sections at the earliest possible date.

THOMAS J. HARRIS,
Chairman, Committee on Scientific Work.

THE PRESENT STATUS OF ANAESTHESIA.

IN England the subject of general anaesthesia has always received special attention and few, if any, of the English hospitals have ever been without a corps of professional anaesthetists.

In this country, however, it has been until quite lately the almost universal custom to relegate the anaesthetic to the house staff, often to its youngest member, and as a result, the anaesthetic has been badly given, to the discomforture of the operator and the patient alike.

During the past five years, owing partly to the endeavors of the committee on anaesthesia of the A. M. A. and the formation more recently of the New York Society of Anaesthetists, a more healthy interest in the subject has been developed and operators throughout the country have become awake to the disadvantages of the old system and the advantage to the patient to be secured by the use of specialists in anaesthesia.

As a natural result, much profitable enthusiasm has developed and some admirable investigations have followed the labors of men who have been able and willing to devote their energies to this important subject.

At the same time, however, as was not unnatural, a devotion to the problem of anaesthesia has brought about much disagreement, and many are the diverse opinions on the subject, so that surgeons who wish to select the best method for their clinic are at a loss to come to a definite decision.

Time was when each surgeon could without fear of criticism direct the anaesthesia himself through the hands of a junior member of the house staff, but operators have learned that difficult surgical procedures require their undivided attention and that they cannot do their best work and watch the anaesthetic at the same time.

The reports of the anaesthesias from the clinics of Halsted, Crile, Murphy, Prince, Cotton and the Mayos have stimulated other operators to emulate the methods practiced in these clinics. But which method shall we choose?

With the single exception of the Rochester clinic, these reports have all extolled the advantages of nitrous oxide and oxygen as the anaesthetic of choice for all kinds of cases and all sorts of patients. Such enthusiasm naturally fills the mind of every surgeon with a desire to institute similar methods so as to escape the unpleasant sequelae of the ordinary methods of narcosis.

The reports that give rise to such enthusiastic recommendations have come from clinics where everything is favorable to the end desired. Anaesthetists who never have another thought than nitrous oxide and oxygen acquire the skill of ultraspecialism and voluminous experience. Surgeons accommodate themselves to the special conditions of nitrous oxide anaesthesia in order to gain the benefits attributable thereto and cultivate that leniency toward the anaesthetist seldom demanded when ether is used. Their interest in reaching a desired end leads them to help and encourage those who serve them in this line of work, by furnishing everything that is necessary to carry out this most difficult of anaesthesias. Such conditions are essential in order to produce the results obtained and when this anaesthetic is used under favorable circumstances with unsuitable apparatus and in unsuitable cases it is small wonder that differences of opinion occur and open skepticism.

The so-called open drop method of giving ether, selected for every case and used always, may best suit the general requirements of such a clinic as that in Rochester; nitrous oxide and oxygen may be used in upward of two thousand cases as at Criles' clinic; Prince of Birmingham may report his two thousand administrations of the same agent (*J. A. M. A.*, May 4, 1912); and so one may go on citing the special methods of every operator of note in the country; nevertheless we believe that no anaesthetist of any experi-

ence but will say with conviction that certain of the Rochester cases, certain of the Prince cases, certain of the Teter cases, could have been more successfully and scientifically anæsthetised by some other anæsthetic procedure than that which the practice of the clinic demanded, since no one anæsthetic procedure or technic is best suited to all patients and for all operations.

Granted that the nurses at Rochester under all circumstances of general anæsthesia would have better results with their open drop technique; granted that Miss Hodgins of the Lakeside Hospital, as Dr. Cotton says, is the best nitrous oxide anæsthetist of the States; granted that Teter obtains unusually good results with his apparatus and his gas. The acme of anæsthetic perfection means the ability to select and administer that anæsthetic best adapted to the physique of the case in hand, the character of the operation to be performed and the disposition of the operator who is to do the operation.

Nitrous oxide certainly has its limitations (see Prince *J. A. M. A.* for May: "Large, robust men took nitrous oxide and oxygen as well as they would have taken ether"). This statement admits the difficulty. Nitrous oxide was forced upon all patients whether or no and the question arises if Dr. Prince has knowledge of the superior efficiency of a skillfully handled ether vapor with oxygen by the pharyngeal insufflation technic, in this class of cases.

Nitrous oxide and oxygen is most certainly not the anæsthetic of choice in robust, adipose, plethoric, resistant individuals with their extremely low factor of respiratory safety and a possible lipoid degeneration of cardiac musculature. These patients can be made to take gas, but it is not the anæsthetic of choice by any means. Rather is the administration of vapor of ether with oxygen by means of pharyngeal or tracheal insufflation the procedure of selection, fulfilling as it does the coincident demand for a powerful cerebral sedative and provision against the most common difficulty in these subjects, namely, the obstruction of the upper air passages, by spasm, by profuse excretion of mucus.

Nitrous oxide oxygen anæsthesia, when carried out in these patients, is forced despite the presence of a varying amount of asphyxia, even by the best anæsthetists, and the limitation of oxygen necessary to produce the required degree of analgesia is harmful and to be avoided.

One other class of cases is to be considered as contraindicating the use of nitrous oxide and oxygen, namely, those in which any serious grade of cardiac disease prevails. The use of nitrous oxide and oxygen is essentially a closed method, and even though sufficient oxygen can be given, respiration occurs under a certain amount of obstructive mechanical difficulty wherever tubes and bags are breathed through.

The low respiratory factor of safety in cardiac disease can little bear any added burden of respiratory obstruction, and the free unob-

structed supply of oxygen and ether vapor offers much greater efficiency and safety than the slightly less toxic but mechanically inapplicable nitrous oxide.

To insist on the use of nitrous oxide and oxygen in these two types of cases is simply to court danger and to bring into undeserved discredit a most valuable anæsthetic when used in suitable cases.

The question of raised blood pressure with nitrous oxide, relative to the possibility of its causing postoperative cerebral hemorrhage, finds answer to date in the observations of Teter in Murphy's Clinics No. 1, and of Prince *J. A. M. A.*, Vol. LVIII, No. 18: "Little variation in blood pressure occurs if plenty of oxygen can be given."

Nitrous oxide is always difficult to administer to the negro on account of the indistinctness of the color changes in the capillary circulation.

Chloroform is especially useful in initiating anæsthesia in children. The gas mask is a thing from demons' land to them and the fear incident thereto is the cause of struggle and often a never to be forgotten fright. The struggle-free, comparatively smooth induction possible with a skillfully handled, well perfumed chloroform mask has advantages far outweighing the safety of nitrous oxide over chloroform. Ether is substituted the minute consciousness is on the wane.

In alcoholics, morphine habitues, tobacco users, resistant subjects, the excitement-diminishing, smoother induction of chloroform skillfully used eliminates that frequently seen syndrome of obstructive respiratory phenomena that does so much to make ether a disagreeable agent to handle in these subjects.

Chloroform can no longer occupy the exalted pedestal it has gained in obstetric work; no less an authority than H. Marion Stowe of Chicago concludes as follows in *Surg., Gyn. & Obst.*, February, 1910: "Uterine atony and post partum hemorrhage are rare following ether anæsthesia; ether should be used in eclampsia or allied toxæmias of pregnancy. Its action is as positive and its danger much less. Ether is far safer to the mother than chloroform and the danger of delayed poisoning much less."

The close similarity between the effect of chloroform on the liver and that of the toxæmias of pregnancy prompts these views.

We must conclude that no single anæsthetic nor method of administration are equally applicable to all cases and that the best results can only be attained by intelligent selection.

W. C. WOOLSEY.

Referring to Dr. Brady's signed editorial in the June issue of the *JOURNAL*, the Committee on Publication and the Editor beg to emphasize the fact that while the article contains much that is of interest and value, its position in the *JOURNAL* should not be taken to mean that in its entirety it carries the endorsement of the Society.

RECEIVED BY PHYSICIANS
JULY 10 1912
PHILA

The Medical Society of the State of New York

THE NON-SURGICAL TREATMENT OF EXOPHTHALMIC GOITER.*

By SOLOMON SOLIS COHEN, M.D.,

PHILADELPHIA, PA.

HYPERTHYROIDISM is a faulty, as well as an insufficient explanation of Graves's syndrome. It is of course true that superactivity of the thyroid may exist without appreciable enlargement, but it needs to be emphasized that goiter, while a usual feature of the morbid complexus, is not essential; and that on the other hand, patients may recover in so far as the cardiac, nervous, gastro-enteric disturbances and the like are concerned, while a moderate degree of thyroid enlargement still persists. The name exophthalmic goiter is unfortunate, since it lays stress upon incidents, either or both of which may be late, lacking or unimportant.

Underlying most of the arguments for making operative treatment the rule, is the false assumption that without such interference recovery cannot take place. On the contrary, the great difficulty acknowledged by most of those who have had large experience in the medicinal management of Graves's syndrome is the liability to over-estimate some particular therapeutic measure, during the use of which spontaneous recovery may have taken place. For such recovery will take place in a very large number of cases without medication or other interference whatever, if only the patient be kept at rest, with regulation of the diet, and under proper hygienic surroundings, *for a sufficient length of time*. Indeed, spontaneous recovery may occur, even without prolonged rest. This, however, is less common.

Operation is not to be opposed, however, under all circumstances. When the diagnosis has been unduly delayed, or when the hygienic and medicinal management has been faulty—and faulty chiefly by the failure to institute persistent rest—the thyroid complication may in consequence become the predominant factor in the case. Pressure by the enlarged gland may cause mechanical difficulties in respiration or in deglutition; may obstruct circulation in the cervical vessels; or by compromising the pneumogastric or other nerves, may give rise to disorders of various kinds. Also, by excessive activity, the hypertrophied gland may disturb cardiac and other functions in great degree. In such instances surgery may indeed be the only remedy; or it may be the remedy of preference. It is quite probable that many surgeons, and especially those noted for their skill in thyroid operations, have formed their opinions concerning the nature and management of exophthalmic goiter in general, largely upon cases of this class.

These are, nevertheless, but a small minority of the whole—possibly 15 to 20 per cent.

Including neglected cases and those in which surgery becomes inevitable, despite early diagnosis and skillful hygienic and medicinal management, 20 to 25 per cent. of all cases would probably be a generous estimate of those requiring operation. Of the other 75 to 80 per cent., from one-third to one-half will recover under rest, regulation of diet and other hygienic measures. In the remaining 40 to 50 per cent. of all cases, skillful and persistent medicinal management is additionally necessary, and will usually be successful.

Operation should be done:

1. When the disorder has persisted for a long time and is advancing, despite skillful medicinal and hygienic management, including prolonged rest.
2. When the disorder is progressive or far advanced, and is either disabling or dangerous, or threatens to become so—even though no sufficient attempt has been made at medicinal and hygienic management, including rest.
3. When the patient's means or social status is such that rest is impracticable, and the disorder, although slight, is partially disabling and has persisted for a year or more under treatment, with no sign of yielding.

There are other circumstances, however, which need not be enumerated, in which the decision is not so easy. Usually no harm will be done in such doubtful cases by waiting and watching for a reasonable time, giving the patient meanwhile the benefit of rest and other appropriate measures. In a proportion, even of advanced or apparently progressive cases, arrest or partial recovery will take place to a degree sufficient to obviate the necessity for surgery.

Therapeutics is in a measure empirical since the data are lacking for accurate classification of cases, etiologically, pathologically, or even symptomatically. Yet the empirical management rests upon a scientific foundation, which may hereafter become broader and firmer.

The etiology and pathogenesis of Graves's syndrome are obscure, but at least three factors may be recognized: (1) a fundamental liability; (2) a provocative agent; (3) a local determinant.

The underlying fundamental liability is congenital, and usually hereditary. It predisposes not only to exophthalmic goiter, but to disturbances of the autonomic nervous system in general. It is probably chemical (possibly anaphylactic) as well as physical, and is expressed both in functional and structural peculiarities, slight or great, which can be demonstrated by careful examination.

The provocative agent is not always the same. Psychic disturbance (especially grief, fear, fright and worry) is a frequent element in causation, but cannot always be traced when the patient

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

comes under observation. Fatigue and intoxications of various kinds apparently play a large part. The toxic substances may be generated within the organism, or introduced from without.

The local determinants are many, but as yet unidentified. Among suggestive circumstances are the variations of the size of the thyroid gland occurring in pregnancy or after parturition, during or after lactation, ovulation, menstruation, etc., and under sexual excitement. Immune members of tuberculous families, and patients exhibiting very sluggish or very rapid tuberculosis frequently exhibit autonomic disturbances, including thyroid enlargement and a tendency to retraction of the eye-lids, while the occasional termination of Graves's disorder in pulmonary or general tuberculosis is well known. The occurrence of exophthalmic goiter in members of neurotic families, and the development of psychosis in a certain proportion of the patients are also familiar; as are the facts that glycosuria may accompany Graves's disorder, diabetes mellitus be its termination, or the disorder occur in immune members of diabetic families. Evidently there is considerable complexity in these reciprocal relations.

Whether ocular error, leading to eyestrain, is to be classed among provocatives or determinants, or is merely a collateral manifestation of the fundamental derangement is not clear. At all events it is commonly present, and its relief by suitable lenses helps recovery.

Clinical and pathologic classification fails for the same reason as etiologic—for lack of sufficiently exact and comprehensive data. That based upon the varying characteristics of the goiter is useful surgically, but medicinally it is inadequate. A rough classification may be made by noting the order of development or the relative severity of cardinal symptoms, and the character and extent of the associated visceral and nervous phenomena; and these factors will in any event greatly influence treatment.

To estimate rightly the worth of treatment, we must agree as to what constitutes recovery. That absence of goiter does not mean recovery is illustrated by the cases in which that symptom never develops, as well as by a case recently observed, in which cardiac and nervous disturbances of an aggravated type were persistent two years after thorough and skillful removal of the thyroid gland. The opposite condition, namely, that recovery may be asserted despite partial persistence of the goiter is shown by many patients treated medicinally. If goiter and exophthalmos have so far subsided as to be neither dangerous nor disabling, and the cardiac, visceral and nervous disorders have disappeared, recovery may be affirmed. As to the ultimate results of medicinal treatment, it is not always easy to follow the patients. Hale White was able to trace a large number of patients treated during twenty years, finding that in 80 per cent.

the recovery was permanent. The speaker's experience is about the same. Surgery does not make any better showing; while its immediate mortality is not yet negligible.

The first element of medicinal treatment is *rest*, which must be sufficient and adequate, both in quality and quantity; adapted, however, to the symptoms of the individual case and the personal peculiarities of the patient. It includes what is sometimes difficult to obtain—namely, freedom from anxiety and other emotional disturbances; also relief of eyestrain and other sources of peripheral and reflex irritation. Nutritional, cardiac and nervous phenomena should be given the greatest weight in determining whether the patient is to be kept at absolute rest, or allowed a certain limited degree of movement, and in fixing the entire period of treatment. The patient should be exposed to fresh air, much as in the management of pulmonary tuberculosis. Diet is to be carefully regulated, but with strict individualization; "one man's meat is another man's poison." A large amount of hot water is to be given to drink in order to cleanse the alimentary tract and aid elimination. The patient is to be sponged alternately with hot and cold water every morning, or some other similar hydrotherapeutic application made, as a measure of re-education of the peripheral blood vessels, and indirectly, of the vasomotor system in general. Skillful massage and intermittent pressure upon the muscular masses, along the spine, help to preserve nutrition and to restore circulatory equilibrium. Concussion and sinusoidalization of the cervical spine are said to be helpful by reflex control of circulation.

Various preparations of the ductless glands are useful, though none is specific. Intramuscular injection is the preferable method of administration, and a fresh extract the best preparation. Commercial preparations intended for hypodermic and gastric administration may, however, be employed, provided one is careful to select the products of a trustworthy manufacturer. Treatment is prolonged; one must not look for miracles.

The action of the glandular products may be direct or indirect; physiologic or antitoxic; stimulant or inhibitory; complementary, supplementary or antagonistic to normal secretions or hormones. Existing data do not permit dogmatism. The choice of agents in the particular case may have to be based on tentative administration and observation of effect. Tendency to excessively low blood pressure specially indicates adrenal or pituitary preparations.

Thymus gland is, on the whole, the most useful, but its efficacy is enhanced by the conjoint or alternate use of adrenal or pituitary. The posterior pituitary lobe is superior to the whole gland. The *pars intermedia* alone is more active than the *pars nervosa* alone, but there is no disadvantage in giving them together, while to sep-

arate the pars intermedia increases the cost greatly. Cases of rapid and marked improvement under the administration of pituitary preparations have been observed, but, as a rule, the effect is of gradual development.

Parathyroid substance is especially useful in the control of muscular tremor, and it is possible that this symptom depends upon mechanical or pathologic involvement of the patient's parathyroid glands. What the patient terms "nervousness" is also relieved by this agent.

Sometimes the thyroid gland atrophies, while the other symptoms of Graves's syndrome persist, and such patients may be benefitted by the use of thyroid preparations medicinally. When myxedematous symptoms supervene, thyroid is of course indicated. It may, however, also be of benefit to certain patients in whom there has never been enlargement of the thyroid gland; a fact suggesting the existence of a class of cases in which over activity of the thyroid is at first a defensive reaction, and only later becomes by its excess, offensive. The medicinal use of thyroid substance permits the gland to become quiescent and obviates the later pathologic phenomena. Such treatment, however, is to be undertaken tentatively and cautiously, for in the ordinary case thyroid is harmful, and its administration should therefore be avoided by those who have not had large experience.

Ovarian substance has been used without much success. The preparations of the corpus luteum promise to be of a certain value in controlling some of the vasomotor phenomena.

When organ-extracts are used by injection, antibodies are sometimes produced. This is a two-edged sword cutting both ways. It is well to intermit, alternate, and otherwise modify and regulate the administration of any and all such agents.

Lavage of the bowel, the occasional use of calomel and salines, and the administration of drugs that will bring about a partial antiseptis of the gastro-enteric tract, are useful adjuncts in treatment. Menthol has been particularly useful in a few cases.

Other drugs that may be used to meet special indications are strontium bromid, neutral quinin hydrobromid, scopolamin hydrobromid, ergot, picrotoxin, digitalis, strophanthus, cactus, caffein, barium chlorid, veratrum viride, aconite and atropin. The quinin salt, used as recommended by Forchheimer, controls nervous symptoms especially, and promotes general recovery. Ergot and picrotoxin increase vasomotor tone, and in cases showing erythema, purpura and the like are particularly indicated. Cactus regulates cardiovascular action and relieves cerebral symptoms dependent on circulatory disturbance. Calcium chlorid and other calcium salts are useful when there is a tendency to pruritis or urticaria, or in connection with the administration of parathyroid substance.

A cold precordial coil or ice bag, or the appli-

cation of cold by coil or ice bag to the cervical spine will help to control excessive activity of the heart.

Of topical measures, various forms of iodine applications are helpful, as are also Roentgenism (probably the use of radium, thorium, etc.) and certain methods of applying electricity.

Beebe's serum has a limited field of usefulness in cases in which cytolysis may take the place of surgery. "Rodagen," a preparation made from the milk of thyroidectomized goats, was used by the speaker in one instance, but caused recrudescence of goiter and nervous symptoms, which had been partially controlled. When it was withdrawn the patient's recovery was promptly resumed and proceeded uninterruptedly. "Antithyroidin" and "thyroidectin" do not seem necessary. Either the patient will get well without them, or else surgery is to be preferred.

Summary.—Graves's syndrome is a complex disorder, having many varieties, a multiple etiology, and an obscure pathology. The goiter is an incident, and the disorder may exist without it. When goiter occurs, existing symptoms are usually aggravated and new symptoms added.

Surgical treatment rarely becomes necessary in cases recognized early. In approximately 15 to 20 per cent. of cases, surgery is made necessary by failure or inability to institute prompt or proper and persistent non-surgical treatment. In about 5 per cent. of cases surgery may become necessary, despite early and skillful hygienic and medicinal management.

The first element in treatment may therefore be stated as early diagnosis. Cases of which the true nature is not recognized are likely to be termed "neurasthenia," "hysteria," "nervousness," "anomalous neurosis," "nervous dyspepsia" and the like. Adequate treatment may thus not be instituted until late; and sometimes, too late. This is probably owing, in part at least, to the unfortunate title "exophthalmic goiter"; for both goiter and exophthalmos may be tardy or absent.

Luckily, rest or partial rest treatment, is often instituted under a mistaken diagnosis—and brings about partial or complete recovery.

There is no specific; but certain useful measures may be organized into a form of special procedure.

Non-surgical treatment is prolonged. Its keynote is individualization. Success depends on patience and persistence, with skillful modification and readjustment of measures to changing conditions. Its principal element is rest, physical and mental, to be modified according to circumstances. Fresh air and regulation of diet are necessary, much as in pulmonary tuberculosis. Active elimination must be maintained. Educational exercise of the vasomotor system by hot and cold applications is always of benefit. Gas-

tric and intestinal lavage may be helpful. Under such management, with perhaps occasional symptomatic medication, (especially the use of intestinal antiseptics), somewhere from 25 to 30 per cent. of all patients may be expected to get well—the cases of so-called spontaneous recovery.

The application of ice water coils over the heart and over the spine, the administration of trustworthy preparations of well chosen organ-extracts, particularly thymus, adrenal, pituitary and parathyroid preparations, together with various forms of auxiliary medication (and perhaps the use of certain mechanical manipulations, topical and radiant applications and electric modalities) will increase the number of recoveries to 80 per cent. or more.

PRIMARY SOURCES OF TUBERCULOUS INFECTION, THEIR RELATION TO EUGENICS AND THE COST OF TUBERCULOSIS.*

By S. ADOLPHUS KNOFF, M.D.,
NEW YORK CITY.

IN this city, a month ago, I appeared before a legislative committee in order to plead for relief from the fearful congestion which to my mind is responsible in not a small measure for the prevalence of tuberculosis, for its still altogether too great morbidity and its high mortality.

To impress the legislators before whom I appeared with the futility of spending money for the cure of tuberculosis as long as they allow the present congestion to exist in our tenements, I had prepared the following table, which, thanks to the courtesy of the various gentlemen at the heads of the institutions enumerated, I believe, I have been able to make as accurate as possible:

The Health Department's Division of Communicable Diseases spends annually \$432,000, of which two-thirds go toward the prevention and cure of tuberculous disease (9 dispensaries, school boats, registration, supervision, disinfection, district nursing)— 2/3 of \$432,000.....	\$288,000.00
Riverside Hospital—Sanatorium, North Brother Isl....	215,000.00
Municipal Tuberculosis Sanatorium, Otisville	200,000.00
Total	\$703,000.00

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

† The Superintendent of the State Hospital adds to this information: "This amount was spent by the city for 103 patients from New York last year. The State paid \$11,672.51, which makes a total of \$27,774.68. The cost of maintenance per week per patient has been \$9.03. The city pays \$5.00 per week, for transportation, also medical examination and minor incidental clothing; the State pays the remainder."

The Department of Charities, taking care of advanced cases, expends annually on the Metropolitan Tuberculosis Hospital	\$290,000.00
For early cases sent to Raybrook	16,102.17†
For patients sent to Seton Hospital	52,700.00
For patients sent to Nazarean Branch	47,000.00
Total	\$405,802.17
The Department of Bellevue and Allied Hospitals spends for its tuberculosis work annually	\$30,000.00
The Charity Organization Society spends for its Committee on the Prevention of Tuberculosis	\$21,929.08
For its Association of Tuberculosis Clinics	5,143.33
Total	27,072.41
The N. Y. Association for Improving the Condition of the Poor spends for its Sea Breeze Hospital	\$21,412.37
For relief work among tuberculous families	27,312.24
For Home Hospital, 23 tuberculous families	23,480.00
Total	72,204.61
The United Hebrew Charities granted to families in which tuberculosis was a cause of distress	\$45,570.00
For the same cause by the sisterhoods affiliated with that Society	13,895.65
The Social Service Dept. of the Free Synagogue.....	5,342.89
Total	65,008.54
The Committee on the Prevention of Tuberculosis of the Brooklyn Bureau of Charities spent last year, including \$2,000 for dental work, essential in the prevention of tuberculosis	16,393.33
The House of Rest for Consumptives, at Inwood on the Hudson, spent in the year 1911	40,555.39
St. Joseph's Hospital spends on its free beds for the tuberculous annually	100,000.00
The Montefiore Country Sanatorium at Bedford Station spent last year.....	\$65,159.83
The Ladies' Auxiliary additional for clothing, etc.....	3,000.00
The Montefiore Home, for its tuberculous patients in the same institution, spends for the treatment of cases from the city additional	18,000.00
Total	101,419.83
The New York Throat, Nose and Lung Hospital spends annually on its tuberculosis work	8,000.00
Flower Hospital Tuberculosis Dispensary.....	1,000.00
The Presbyterian Hospital Dispensary....	10,000.00
The Good Samaritan Dispensary	5,700.00
The Vanderbilt Clinic	5,167.48

German Hospital Tuberculosis Dispensary	\$3,660.00
St. Bartholomew's Clinic	1,200.00
St. George's Tuberculosis Class.....	1,200.00
Morgagni Clinic	2,400.00
Mount Sinai Hospital Tuberculosis Clinic.	10,000.00
Tuberculosis Preventorium for children spent last year	15,000.00
The Loomis Sanatorium at Liberty esti- mates the amount of money spent an- nually for the benefit of patients from the City	22,239.99
The Adirondack Cottage Sanatorium at Trudeau, N. Y., spends for the same purpose	25,000.00
The Stony Wold Sanatorium at Lake Kushaqua, N. Y.....	66,981.91
Society of St. Vincent de Paul, estimated expenses for tuberculosis work.....	75,000.00
Estimated cost of individual philanthropy for the tuberculous poor	200,000.00
	\$2,014,005.57

You will see from this that we are spending annually about two million dollars in the city of New York alone for the tuberculosis cause, and when you consider the many relapses which occur, because a large majority of those who are cured or whose disease is arrested in our public institutions fall victims to the disease anew shortly after their return to their former environments, you will grant that a good portion of this two million dollars is spent in vain. Again, you must consider that we not only have a great many relapses because the cured patient on his return from the sanatorium finds exactly the same environments as those in which the disease was contracted or developed, but that these environments are such that the children of a tuberculous father or mother are almost sure to become infected.

Is it a wonder then that we have to-day in the City of New York, according to some authorities, 45,000, and according to others, 60,000, tuberculous individuals? While neither one of the estimates may be exact, we know that in spite of the combined agencies, the Health Department's statistics for last year show a loss of 10,258 individuals by death from tuberculosis; and naturally you all know that because of the chronicity of this disease it causes more mental and physical suffering and individual financial sacrifice on the part of the poor than any other known affliction. Thus, I am sure you will agree with me that it is time to pause and ask ourselves, is this expenditure on the part of the commonwealth and the individual worth the while? Is it practical, is it economical, is it just, is it humane to make these financial sacrifices for such relatively small returns?

What applies to New York applies virtually to the whole country. The National Association for the Study and Prevention of Tuberculosis reports that more than \$14,500,000 was spent in fighting tuberculosis during the year 1911. By far the largest item of expense was that for sanatoria and hospitals. For the erection of institutions of this kind, more than \$11,800,000 were spent.

Dispensaries for the examination and treatment of tuberculosis spent \$850,000, and associations and committees in their educational campaign against tuberculosis spent \$500,000. The remaining \$1,300,000 was spent for treatment in open air schools, prisons and hospitals for the insane. Appropriations of more than \$10,000,000 for tuberculosis work in 1912 have already been made by State legislatures and municipal and county bodies.

To say that at least \$50,000,000 are invested in buildings and equipments in the United States by State, municipal and private philanthropy for the sole purpose of caring for the tuberculous poor would indeed be a low estimate, and in this sum is not included the money invested in sanatoria for the well-to-do. The \$15,000,000 above mentioned for running expenses likewise does not include the actual money expended for the care of the consumptives outside of institutions; still less does it include the economic loss to our country by the premature death of tuberculous individuals.

Of the estimated 150,000 who die annually from tuberculosis in the United States, I venture to say 50,000 have been bread winners, and estimating the value of such a single life to the community at only about \$1,500, this makes a loss of \$75,000,000 each year. Another third, I venture to say, represent the children at school age. They have died without having been able to give to their parents and to the community any return. Making the average duration of their young life only 7½ years, and estimating the cost to parents and the community at only \$200.00 per annum, the community loses another \$75,000,000 because it has not prevented a preventable and curable disease in childhood.

I am not figuring in dollars and cents the cost of little babes who die in infancy. The suffering thus caused to parents can no more be calculated than the suffering, misery, tears and agony of those afflicted with the disease itself. But I trust that the cold figures I have given showing the economic loss, and our knowledge of the suffering which is caused in body and mind to untold numbers because of this disease, will inspire you and me to look a little more closely into the origin of tuberculosis, the primary sources of infection and their relation to eugenics; and, if possible, to inaugurate more efficacious prophylactic measures, so that we may have more frequent cures and fewer relapses.

In order to study these problems carefully let me now for a moment trace the life history of a few tuberculous individuals and see whether we cannot learn something bearing on the subject of primary sources of infection and their relation to eugenics. We may, perhaps, thus also get a more rational explanation of the prevalence of tuberculosis in our present state of civilization, or let me say regretfully, in spite of our present state of civilization.

A young man and a young woman meet, love, and marry. Neither knows anything of the other's physical condition. The law in most of our States does not demand a certificate of health prior to entering the matrimonial state. The young woman may have worked in a shop or factory from the age at which the law permitted her to work (in some States this age is the age of childhood). The young man, a laborer, a skilled artisan, or clerk, with a modest income, owing to high rents and the high cost of living must take his bride to crowded quarters and when, in the natural course of events, children arrive, what are the chances for these children if either of the parents happens to be tuberculous? It is a sad chance these children have. According to a careful study of Dr. James Alexander Miller and Dr. J. Ogden Woodruff of New York (*Jour. Amer. Med. Ass'n*, March 27, 1909), children of tuberculous parents who live in close association with such parents have been found to be positively tuberculous in 51 per cent. of cases.

When we now consider the statistics of Biggs, Brouardel, Naegeli and a great many others, who assert that the vast majority of city people, working or living in confined quarters, have or have had an active or latent or healed tuberculosis, I believe I am safe to say that at least 25 per cent. more of the children of the masses have an undiscovered tuberculous focus. This focus may heal, as it doubtless does, in many instances, but when it does not heal entirely and a girl grows up to womanhood, marries and bears children, the chances are very much against her and an acute tuberculosis will most likely develop. The child is born; if the woman has been fortunate enough to have had the disease discovered she will probably not give the child the breast; if she does nurse the child herself she will decline more rapidly. But in either event this child is surely born with a physiological poverty not ready to resist later sources of infection.

From the very interesting work of my associate, Dr. Bertram H. Waters, senior instructor in phthisiotherapy of the New York Post-Graduate Medical School and Hospital and chief of the Health Department's clinics, entitled: "An Experimental Study of a New Remedial Agent and of its Effects in Pulmonary Tuberculosis," I have selected a number of cases of tuberculous women to show the vast difference in the constitution of the blood from that of the normal woman. In the normal individual there should be in the female in each cubic millimeter 4,500,000 erythrocytes, about 8,000 leucocytes, 0.95 hæmoglobin and 20.25 lymphocytes. Following is a careful analysis of the condition of the blood of 6 tuberculous women:

Case 5, that of a tuberculous woman 18 years of age, in the earlier stage of the disease, showed on examination 4,100,000 red blood cells, 9,200 white blood cells, 0.81 hæmoglobin, and 21.5 lymphocytes.

Case 6, that of a woman of 24, likewise with relatively early lesions, showed on examination 4,100,000 erythrocytes, 10,100 leucocytes, 0.75 hæmoglobin, and 17.4 lymphocytes.

Case 7, in a woman 24 years of age, with the disease of about one year's standing, showed a blood count of 4,400,000 erythrocytes, 7,800 leucocytes, 0.86 hæmoglobin, and 19.6 lymphocytes.

Case 8, in a woman 34 years of age, in the latter stage of the disease, showed at repeated examinations so low a count as 3,620,000 erythrocytes, 16,920 leucocytes, 0.81 hæmoglobin, and 20.4 lymphocytes.

Case 18, in a woman 25 years of age, afflicted with the disease for about two years, revealed the interesting fact that, at about the time she left the institution where she had the best hygienic care, and in addition the terpisone treatment, she had a blood count of 4,480,000 erythrocytes and 18,100 leucocytes. Four weeks' renewed sojourn in her congested home reduced the red blood corpuscles to 3,952,000, with a count of 34,200 white cells, 0.77 hæmoglobin, and 10.0 lymphocytes.

Case 19, in a young girl 14 years of age, in the latter stage of the disease, but of relatively short duration, showed 4,360,000 erythrocytes, 28,300 leucocytes, 0.79 hæmoglobin, and 6.0 lymphocytes.

You will thus readily see why the child of a tuberculous mother lacks that physiological vigor which should be the heritage of every one. Unless the child is taken from its tuberculous parent and put in an ideal environment or the mother and child are enabled to leave the unhygienic environment and be placed in such conditions as surely and lastingly to cure the mother's tuberculous trouble and the child's inherited predisposition, the morbidity and mortality statistics of tuberculosis will be increased by two.

If the father is the tuberculous parent and the mother is unusually vigorous and has resisted infection, the chances are that the child is free from tuberculosis; but its chances of becoming infected by close contact with the tuberculous father are obviously great, as the danger of post-natal infection is always present when an infant is cared for by, and comes often in close proximity to a tuberculous individual.

We come now to another of the primary causes of tuberculous predisposition, the basic reason for which may be social as well as physiological. In taking the history of tuberculous patients I have made it a practice for years always to ascertain the size of the family from which the individual comes and whether he was the first, second, third, fourth, fifth, etc., born of the family. This careful history-taking has revealed the fact that the great majority of tuberculous individuals coming from large families were the younger.

It is nearly always the later born who contract tuberculosis.

There is no doubt in my mind that perhaps the age of the father, but most frequently the system of the mother worn out by repeated pregnancies, has contributed to the physiological poverty of that later born child. This child comes to the world handicapped physiologically. In many instances when the family, because of the number of children, has been reduced to a state of relative poverty, the later born children cannot receive or have not received either the good care or the good food which was given to the first born at a time when there were not so many mouths to feed. This condition might be considered the sociological reason of the child's predisposition to tuberculosis, added to the physiological causes above described. I have in my records a number of such later born individuals who had become tuberculous in adult life when there was no tuberculosis in their family, but the personal history revealed always a state of health below par from early childhood.

It would not do, before an audience of this kind, to deny the possibility of direct bacillary transmission through the placenta. These cases are rare, it is true, but they occur and they occur perhaps more frequently than our statistics seem to indicate. Osler, in his "Practice of Medicine," states that in 125 autopsies at the Foundling Hospital in New York the bronchial glands were tuberculous in every case. Francine, in his book on Pulmonary Tuberculosis, contends that it is possible that after the bacillus has reached the fetus it may live dormant in the lymphatics of the newborn for six months or longer, yet the infection has been directly hereditary. Malone of Georgia, in a recent contribution entitled "Pulmonary Tuberculosis," goes so far as to say that all cases of tuberculosis of which he has knowledge were inherited, but he does not give the number of cases, nor how he came to his conclusions (*Medical Progress*, Louisville, Ky., Feb. 12, 1912).

Recognizing fully the possibility of direct bacillary transmission, I nevertheless assert that post-natal infection is the most frequent cause of tuberculosis in childhood.

It is, of course, well known that alcoholism in the adult is a very strong predisposing factor to tuberculosis. In my service at the Riverside Hospital-Sanatorium, on North Brother Island a large number of patients are alcoholics and the prognosis in such cases is almost invariably unfavorable.

I admit that at the Riverside Hospital-Sanatorium I have not the élite of clientele, many of my male patients being forced in cases found in lodging houses or in the poorest tenements, and sometimes picked off the street.

One of my resident physicians of the Riverside Hospital-Sanatorium, Dr. Arch. J. Dixon, has been good enough to compile for me the

following interesting statistics. They show that chronic alcoholism should be considered one of the most important factors in an acquired predisposition to tuberculosis:

In 1908: 349 cases, of which 258 were males and 91 females, gave the following alcoholic history:

	Small Amount	Moderate	Excessive
Male	6	135	51
Female . . .	2	21	1

This is 192 out of 258 males, or 74%.

In 1909: of 901 cases; 694 males, 207 females:

	Small Amount	Moderate	Excessive
Male	14	311	160
Female . . .	5	35	5

This is 485 males out of 694, or 69%.

In 1910: of 773 cases; 579 males, 147 females:

	Small Amount	Moderate	Excessive
Male	29	256	121
Female . . .	12	23	2

This is 406 males out of 579, or 70%.

In 1911: of 418 cases; 297 males, 121 females:

	Small Amount	Moderate	Excessive
Male	9	121	71
Female . . .	9	9	0

This is 201 out of 297 males, or 66%.

The relation of eugenics to tuberculosis, when the parent has been an alcoholic, has not been as carefully studied in this country as might be desired. This is probably due to the lack of special sanatoria for tuberculous children—the only places where these statistics can be carefully compiled. France, which has the distinction of doing far more for its tuberculous children than for its tuberculous adults, has not only a great number of seaside and inland sanatoria for children afflicted with tuberculosis of all kinds, but also a special society called "L'oeuvre de préservation de l'enfance contre la tuberculose," founded and endowed by my beloved and much regretted master, Professor Grancher. This latter society takes care of children of the tuberculous poor of great cities by placing them in good country homes under careful medical supervision. Statistics in the children's sanatoria in France have shown conclusively that 25 per cent. of the non-tuberculous parents of these tuberculous children admitted were alcoholics to a greater or lesser degree. This shows conclusively that when we study eugenics in relation to tuberculosis we must not neglect the alcoholic parentage.

Unfortunately, I have not been able to get at any statistics concerning syphilis as an etiological factor in tuberculosis. Only in the rarest instances will parents admit a syphilitic

history, particularly when they think that through this admission the physician will hold them responsible for the child's affliction. I communicated regarding this matter with Dr. Alfred F. Hess, the physician in chief of the Preventorium at Farmingdale, N. J., where none but predisposed children are received, and he assured me that it was almost impossible to get parents to admit a syphilitic history. Yet, there is no doubt in my mind that the non-treated or not thoroughly treated syphilis in the parent will render the child, by reason of its syphilitic inheritance, also more prone to tuberculosis.

The social evil, or rather the social ill, as I prefer to call it, certainly is a predisposing factor to tuberculosis among the unfortunate women who for one reason or other have been forced to take up this life of misery and shame.

That the mentally defective child will fall more readily a prey to the germs of tuberculosis, our asylums for the feeble minded and insane prove beyond a shadow of doubt. Thus, in our studies it will not do to neglect the mentality of the parents.

After having considered these several different physiological and pathological relations of eugenics to tuberculosis, we must now speak of the last cause, which I do not know whether to classify with the pathological, the physical, or the sociological ones. Poverty, misery, want and overwork we know to be productive of a soil fit for all sorts of illnesses, but particularly the invasion of the tubercle bacillus. It matters not whether this condition is produced by underfeeding or malnutrition, by a worn-out system, by a depressed spirit, the inhalation of vitiated air in unsanitary workshop or overcrowded homes, or all of these factors combined, we know that the poor, overworked and badly housed furnish a very much larger proportion of the army of the tuberculous than the well nourished and well housed, and that the relapses among the cured consumptive poor are many, many times more frequent than among the well-to-do.

Let us now rapidly trace some of the primary sources of tuberculous infection. First of all would have to be considered the milk of the tuberculous mother when it is not known to herself or to her physician that she is tuberculous or, as unfortunately happens not infrequently, she gives the child the breast against the physician's advice. No statistics on this subject are available, yet, to judge from my own consultation and hospital practice, there is no doubt that tuberculosis is not infrequently thus transmitted to the infant. That the bovine type of the bacillus of tuberculosis must be considered a very important factor in primary sources of tuberculous infection has become more and more evident by recent researches in that direction.

Let me merely quote here from the admirable paper describing the work done in the research laboratory of the Department of Health of New York under the able direction of Professor Wm.

H. Park and Dr. Chas. Krumwiede, entitled "The Relative Importance of the Bovine and Human Types of Tubercle Bacilli in Different Forms of Human Tuberculosis."

PERCENTAGE OF BOVINE INFECTION.*

Diagnosis.	Adults 16 Years and Over.	Children 5 to 16 Years.	Children Under 5 Years.
Pulmonary tuberculosis	†0%	0%	0%
Tuberculous adenitis, cervical	4%	37%	57%
Abdominal tuberculosis	16%	50%	68%
Generalized tuberculosis	3%	40%	26%
Tubercular meningitis (with or without generalized lesions)	0%	0%	15%
Tuberculosis of bones and joints	5%	3%	0%

Thus you see that, while the bovine type of the tubercle bacillus, as an etiological factor in pulmonary tuberculosis of the adult, may be considered a negligible factor, in children, on the other hand, bovine tuberculosis is responsible for a very large percentage of cervical, alimentary, and bone and joint tuberculous affections; and since milk is the principal food of infants and young children we must hold the tuberculous cow responsible for the large percentage of tuberculosis in childhood.

The next most important primary sources of infection in childhood are obviously to be sought in the bacilliferous saliva and bacilliferous sputum of the tuberculous individual in close and prolonged contact with the child. There is the tuberculous mother's or father's kiss, conveying the bacilli to the child through the bacilliferous saliva; the tasting of the milk to judge of its temperature through the rubber nipple before inserting it into the mouth of the child; the use of the same spoon when testing other food as to temperature and taste; the use of the same drinking glass; the careless coughing over the child conveying the bacilliferous droplets during the so-called dry cough; the tuberculous midwife resuscitating the stillborn; the inhalation of the bacilli-laden air derived from dried tuberculous sputum; the deposit of tuberculous germs carried by the fly from uncovered sputum receptacles to milk and other food products intended for the child. I have seen other instances of likelihood of tuberculous infection such as the child putting its little fingers into the tuberculous mother's mouth and then into its own; the tuberculous mother moistening her handkerchief with her tuberculous saliva to remove a little dirt from the child's face, or kissing little scratches or abrasions on the child's hands to remove a little blood or make the child forget the little injury.

Most of what has been said of primary sources of infection in infancy holds good of course also of infection in the older child and in the adult.

* Exclusive of the cases of double infections. In considering the pulmonary cases it must be remembered, however, that bovine tubercle bacilli have been isolated from the lung in cases of generalized tuberculosis in children.
† If one doubtful case admitted, 0.2 per cent.

In school, the healthy non-tuberculous child is exposed to the acquisition of a predisposition by too long hours of school work, too much home study, too little sleep, too little play, and not enough outdoor life. It can become infected by a tuberculous fellow pupil. The habit of kissing, particularly among girl pupils, of using the same drinking cup, of putting toys in the mouth, etc., are some of the methods of direct infection.

In adult life various trades and professions, particularly those involving the inhalation of mineral or vegetable dust and necessitating an indoor life, create a predisposition to tuberculosis, and the laborer or employee in factory or office is exposed to contracting the disease from a careless tuberculous fellow worker.

The well known methods of infection in adult life need not be recapitulated here. I wish to mention only a few of the rarer ones, or rather those more rarely thought of; for example, the moistening of the final leaf in making a cigar by the saliva of a tuberculous cigar maker; glass blowers using the same mouth piece. The tuberculous waiter, the tuberculous cook and the tuberculous maid can convey the tuberculous infection in various ways. The tuberculous bookkeeper, coughing over his books, moistening his fingers to turn the leaves with his bacilliferous saliva and working, as a rule, in a badly ventilated office, has in not a few instances given tuberculosis to his successor on the ledger. I have the assurances from physicians practicing among the devout Roman Catholic population in Canada that to the indiscriminate kissing of relics not a few cases of tuberculosis may be traced.

Tuberculosis has been transmitted by inoculation through the practice of tattooing, the operator having been tuberculous and dissolved the colors with his own saliva. Cases of tuberculous inoculation are also now and then reported as a result of circumcision, practiced according to Jewish rites, when the operator happens to have been consumptive. The operation of circumcision, when skillfully and rapidly performed, is in itself trifling, but the sucking of the prepuce afterward makes it dangerous. The employment of a glass tube for the latter purpose and to educate the operator in asepsis will suffice to overcome any possible danger of tuberculous inoculation. In many instances these operators have only a theological and no surgical training whatsoever.

Those of us who have lived and worked with the tuberculous will be able to recall many other direct or indirect means of infection. Poncet, of Paris, asserts that he has found the tubercle bacilli in the perspiration of consumptives. His experiments have not yet been corroborated sufficiently to consider this possible source of infection an absolute fact. If it really occurs, the cases in which tuberculosis is contracted from this source might be considered exceedingly rare, and

in view of the existing phthisiophobia, I do not think it is best to scare the public and increase the prejudice of people by saying that the touch of the skin of the tuberculous might give rise to the disease. Ordinary cleanliness of the skin of the phthisical patient is certainly sufficient protection against this rare source of infection. In the presence of a tuberculous patient suffering with excessive hyperidrosis the nurses in attendance are instructed to wash their hands after having attended the patient and to place the soiled personal and bed linen in water until subjected to the usual steam or hot water for cleansing and disinfecting.

Let this enumeration of the more rare primary causes of infection suffice for our purpose to-day and let us rather turn our attention to what after all is the most important part of our subject: What can we do to get at the bottom of it all? What can we do to abolish the predisposing or antenatal causes and the postnatal infection responsible for the propagation of tuberculosis?

Our social reformers will tell us: The first thing you physicians must do is to prevent the tuberculous from marrying. This is more easily said than done. Certainly we know there are a number of States in which a certificate of health is demanded before a license is issued, and recently some brave clergymen, foremost among them the Very Rev. Walter Taylor Summer, of the Protestant Episcopal Cathedral of St. Peter and Paul of Chicago, have declared that they would bar all marriages unless the couples were armed with a physician's certificate saying that they have no trace of insanity, tuberculosis, or other communicable disease. If I have the quotation correct, I would object to the wording of this declaration, for, if the reverend gentleman really means that he will not marry anyone who has even a trace of tuberculosis, he will have a chance of performing the ceremony relatively rarely. What the old German Geheimrat said many years ago still holds good. I refer to the often quoted words, "Am Ende haben wir alle ein bischen Tuberkulose," which might be freely translated, "taking all things into consideration, perhaps every one of us has or has had at some time or other a little tuberculosis."

A mere trace of tuberculosis should not bar anyone from marrying and propagating, but with a distinctive lesion, likely to become acute at any moment, or with a very strong predisposition, marriage and procreation should be deferred until the prospective husband or wife is cured. I cannot speak for the experience of others, but as for myself in years of consultation practice, I have had occasion to prohibit marriage a good many times. Sometimes, those who had sought my advice obeyed it, more frequently they did not, and I have come now to the firm conviction that neither State law, clergyman's protest, or physician's advice will prevent people from coming together as husband and wife if

they want to. I grant that there are exceptions, but these exceptions are few.

A somewhat easier task is it when we are confronted with a tuberculous married man or woman whom we desire to convince that as long as he or she is acutely ill with the affliction there must be no children. Such advice the average tuberculous patient is willing to take, but obviously failures are frequent. What are we to do? This is one of the most important phases of eugenics. We spent last year nearly \$15,000,000 for the cure and prevention of tuberculosis in the United States in institutions alone and we still lose annually 150,000 people from consumption, which represents an economic loss of \$150,000,000. This will continue as long as we allow conditions to prevail as they are now almost universally.

Has the time not come for a radical and energetic policy for dealing with various phases of the tuberculosis problem, including the procreation of a tuberculous race? Beside pleading with all the earnestness I am capable of for all means to combat tuberculosis for which others and I have pleaded before, such as early diagnosis, compulsory registration, periodical examination for tuberculosis of all school children and of the employees in factories, workshops, and offices, the establishment of maternity sanatoria, children's sanatoria, sanatoria for early cases, hospital sanatoria for the advanced cases, dispensaries, labor bureaus for the tuberculous, agricultural and horticultural colonies, better housing, better home hygiene, better ventilation in factories, stores, offices and workshops, supervision of food supplies, abolition of child labor, more open air schools, utilization of city roofs for playgrounds, more outdoor play for all children, and education in popular hygiene for all people, I plead with you for vasectomy for all tuberculous male patients who are willing to submit to this operation. I should make this operation obligatory for anyone who is acutely tuberculous and insists upon marrying. I would advise the ligation of the Fallopian tubes for all female patients in the same situation, or similarly afflicted. I would teach even slightly affected tuberculous parents or married people not only all the details of prophylaxis so that they may not infect each other, their children, or others, but should make it also a sacred duty to teach them how not to procreate while either one of them is acutely afflicted with the disease. To this end I should go so far as to urge that parents, even when they feel themselves apparently well and strong and recovered from a tuberculous lesion, not to decide on having a child without both submitting themselves to a careful physical examination. Only when found in really good health as a result of a careful examination by a competent practitioner, should they feel that they have a right to procreate a race.

I know this sounds revolutionary and to some

it may be a shock; but I know that many in their heart of hearts will agree with me in that, after all, it behooves us as true physicians to be true doctors—true teachers, and that to make the human race strong in health and vigor, sound in mind and body, free from unnecessary care and preventable disease, should be a religious duty of the physician of this age.

I may incidentally state here that in the cases on record where for one reason or another vasectomy or ligation of the tubes was performed, the recoveries were rapid and uneventful, and the general condition of the patient was much improved. In suggesting these radical prophylactic procedures I do not wish to be misunderstood. In an early or very moderately advanced pregnancy of a tuberculous mother, I do not counsel emptying the uterus unless I am convinced that the mother's life is in certain danger, and I gladly state that I never, never assume the responsibility of counselling so grave an operation without having two colleagues—one a competent internist and one a gynecologist or obstetrician, in consultation. In addition, I procure the written consent of the husband to the operation. When it is decided to let the pregnancy go on, we should environ the mother with the best possible hygiene and submit her to the most careful dietetic treatment. This can be done in the homes of the well-to-do, I believe, with fair success; but for the poor we must have maternity sanatoria where the mother can live several weeks before and several weeks after confinement. The physiological poverty, invariably inherited from a tuberculous mother, should be treated in the child. This again cannot be done in the average home of the poor.

I have spoken before of the French society founded by Grancher for the preservation of childhood against tuberculosis ("L'oeuvre de préservation de l'enfance contre la tuberculose"). Much as I admire this work of my beloved teacher, I do not feel that it is the ideal way of taking care of the strongly predisposed or already tuberculous child. The separation of the mother from her child has always appealed to me as something which should be resorted to only when absolutely necessary. To place not only the child but the mother as well, in fact, the entire family, in hygienic environments, where they may breathe good air, have well lighted and clean rooms perhaps so arranged that outdoor sleeping is feasible, and where there is medical supervision, would seem far superior to the separation of child from mother. By this method the whole family would receive the benefit of preventive and curative care.

While the out-of-town district would be ideal for such homes of tuberculous families, it seems that even a great city when it has citizens public spirited enough to devote their fortunes to such a laudable purpose, may have such a

home hospital. A beautiful example of such a sanitary home for tuberculous or predisposed families exists now in the City of New York, and is known as the East River Homes, at 78th Street and John Jay Park, which were built by the generosity of Mrs. Wm. K. Vanderbilt, Sr. Here, a number of families with members who are strongly predisposed to tuberculosis, or have recovered from the disease, receive the advantage of almost ideal homes with every room lighted and ventilated and with all modern sanitary improvements, for a most moderate sum. To give also to such families where the bread winner is yet an invalid or not strong enough to support a family, the advantage of such a home, the New York Association for Improving the Condition of the Poor has leased for three years an entire section of the East River Homes. This section consists of twenty-four apartments with a south-eastern exposure. The trustees of the East River Homes have given the association entire control of the open stairway leading to these apartments and free access to, and partial control of the ideal roof garden. These families will be carefully supervised by physicians and nurses.

I have referred to syphilis as a factor in tuberculosis. It would be extraneous to this paper to review all the agencies proposed to overcome venereal disease, which is just as much a plague as tuberculosis itself. My own views in the matter, I may sum up by saying, that when we shall have once ceased to be afraid to talk of sexual matters with our children and have instructed the parents how to teach children such matters; when we have impressed the masses with the fact that the danger of the infection from venereal disease increases when it remains hidden, undiscovered and untreated; when we have provided special wards for the treatment of such diseases in all general hospitals, made conscious transmission of the disease by sexual or other intercourse a crime, then may we hope to have advanced a step in the direction of combating this second great social disease of the masses.

To combat the social ill, wrongly called evil,* requires first the social readjustment of the status of woman. If she is alone she must earn enough to be able to live from her earnings decently and respectably;

* I prefer the word *ill* to *evil*, for the general understanding of the word "evil" implies that the perpetrator of the act which is supposed to be an evil one is an evildoer or criminal. I believe it is neither just, humane, nor even constant to call these offenders, male or female, criminals in every instance. I do not think it necessary to state here that there are numerous cases in which the unfortunate woman is really innocent, if not before the laws made by men, at least before the higher divine laws. That there are also instances when the other sex, the innocent and unknowing youth, has fallen a victim to the experienced, unscrupulous courtesan, often old enough to be his mother, is also too well known to need detailed mention.

When not applied to physical conditions, the word *evil* is usually understood as wicked conduct or criminal disposition, while the word "ill" or "illness" means a derangement and an unwholesome condition. By rights, we should not even call prostitution the social evil or ill, as it is by no means the only one, for surely alcoholic intemperance and gambling must also be considered social evils responsible for fully as much misery as prostitution.

if she is dependent for her living on the earnings of a male member of the family (father or brother) the earnings of these male members must be adjusted so that they can support the female members of the family in respectability. Repression of the social ill I consider better than oppression; early marriages and small families, must also be considered an important factor in the solution of this serious problem.

Humanity demands that we treat the mentally defective child, the feeble-minded, the idiot and the insane in closed institutions. That tuberculosis is thereby propagated is well known. The treatment of these unfortunates when tuberculous must be the same as for the sane tuberculous. But regarding prophylaxis from a eugenic point of view vasectomy and the equivalent operation in the female would seem to be specially indicated in these cases.

I have given as the last predisposing factors to tuberculosis poverty, misery, want, overwork, underfeeding, a worn-out system, a depressed spirit, the inhalation of vitiated air, the unsanitary workshop, and the overcrowded tenement.

The more dense the population, the greater the poverty, the more tuberculosis. My colleague, Dr. John S. Billings, Jr., director of the tuberculosis clinics of the New York Health Department, expresses himself regarding this subject as follows: "Tuberculosis furnishes the best example of the harmful influence of overcrowding and its attendant evils on the morbidity rate of a community. For the past fifteen years the Department of Health of the City of New York has plotted every case of pulmonary tuberculosis occurring in the borough of Manhattan on large insurance maps showing every house in the borough. A study of these maps shows that in many of the better sections of the city not more than seven or eight cases have been reported from a given block during the whole of the fifteen-year period. But in densely crowded sections of the city where the tenements are old, filthy and saturated with tubercle bacilli, the story is a very different one. One example is sufficient: In the so-called "Lung-block," bounded by Catherine, Cherry, Market and Hamilton Streets, from 1894 to 1898, 175 cases were reported; from 1899 to 1903, 111 cases were reported; and from 1904 to 1908, there were 82 cases reported, giving a grand total of 368. These figures call for little comment." (First New York City Conference of Charities and Correction).

To describe the remedies suggested for this last factor in tuberculosis would mean to write a sociological treatise, which I am neither capable of doing, nor would it be in place in a medical paper. Permit me to express only a few thoughts on the subject. We are indebted to Professor Patten, a great authority on social questions and political economy, for the follow-

ing striking aphorism: "Sin is misery, misery is poverty; the antidote of poverty is income." Adapted to the tuberculosis problem, one might say tuberculosis is often the result of congestion, want and misery, and since all these three evils mean poverty, the antidote to all of them is also income. If not higher income to pay for higher cost of living and higher rent, let us have a lower cost of living and lower rents. When rents are reduced, the population will spread; when food is cheaper, the masses will eat better. Our statesmen and our political economists must help us in overcoming these conditions.

As one of the important factors of eugenics in tuberculosis I have mentioned alcoholism. Its prevention and cure are primarily sociological, secondarily medical, and I hope at some future time to express at length my views on the subject. Today I wish merely to say that I consider alcoholism a disease preventable and curable, first by educational prophylactic measures, and if they don't suffice, by more drastic methods. Sanatoria for the treatment of inebriates will have to be a feature of the hospital system of any community which is in earnest to overcome alcoholism.

In conclusion permit me to say: If this little study of primary sources of infection and their relation to eugenics and the cost of tuberculosis has taught me anything, it is a conviction which I have expressed more than once in my life as a motto, namely:

"To combat consumption as a disease of the masses successfully requires the combined action of a wise government, well trained physicians, and an intelligent people."

TREATMENT OF THE TYPHOID CARRIER.*

By F. M. MEADER, M.D.,

SYRACUSE UNIVERSITY, SYRACUSE, N. Y.

MAN is the great reservoir from which most human ailments are derived. This conception has arisen only during recent years when it was discovered that many pathogenic organisms might live a parasitic existence in one man, only to produce the disease in the next when suitable conditions occurred. As it were, a man may become a Trojan horse and his unsuspecting neighbors, like the ancient Greeks, welcome him to their midst, and if their defenses are impaired, welcome him to their sorrow.

This great fact of human carriers of disease germs, about whom no quarantine signs are evident, makes this a subject of first importance.

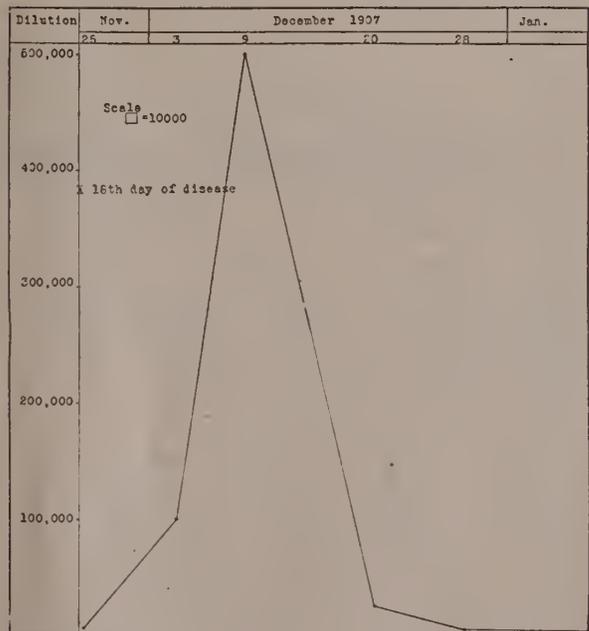
It is difficult to detect these individuals, and it is even more difficult to treat them when discovered.

In the time with which you honor me, I shall seize the opportunity to discuss briefly one corner of this subject: namely, the treatment of carriers, and particularly typhoid carriers, and I shall limit myself further to the treatment of typhoid carriers by methods of immunization, because it is this particular phase of the subject over which my experience extends.

It is evident at once that in a subject of this kind, an investigation of the underlying factors in immunity to typhoid fever is imperative. We must understand the mechanism by which a person recovers from typhoid fever normally, because it may be that in the case of a typhoid carrier the normal processes have been disturbed.

Briefly stated, there are present in the blood of normal people two substances; one (following the German terminology) complement is present in fairly constant amounts in all people, healthy and diseased. It has the property when attached to any kind of bacteria or foreign cell to dissolve it. The other substance is called amboceptor or bacteriolysin. It is present in variable amounts, and its property is to connect the complement to the bacterial cell or foreign cell. During normal cases of typhoid fever these amboceptors are comparatively few at the beginning, but as the disease progresses they become very rapidly numerous and then as rapidly disappear if the patient recovers.¹ Chart I. Hahn has shown that at a certain stage in the disease the patient's blood may be diluted four million times and yet

CHART I.
CURVE SHOWING RAPID RISE AND FALL OF AMBOCEPTORS IN A CASE OF TYPHOID FEVER. DENISON'S CASE 6.



* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

¹ Johns Hopkins Hospital Bulletin, Sept., 1910.

the presence of amboceptors can be demonstrated.

Now, these amboceptors can be increased in the blood of a normal person by injecting (usually subcutaneously) a vaccine. By vaccine I mean a culture of the organisms—typhoid culture that has been so injured that they will not multiply in the body. This is accomplished by heat or by dilute carbolic acid.

Living organisms stimulate the body to the production of amboceptors best of all, but if they are attenuated or impaired so that they cannot multiply their power to stimulate the body to produce these amboceptors is little diminished. However, if they are destroyed by too much heat or disinfectant they are like so much inert matter and the body will not be stimulated to produce these amboceptors.

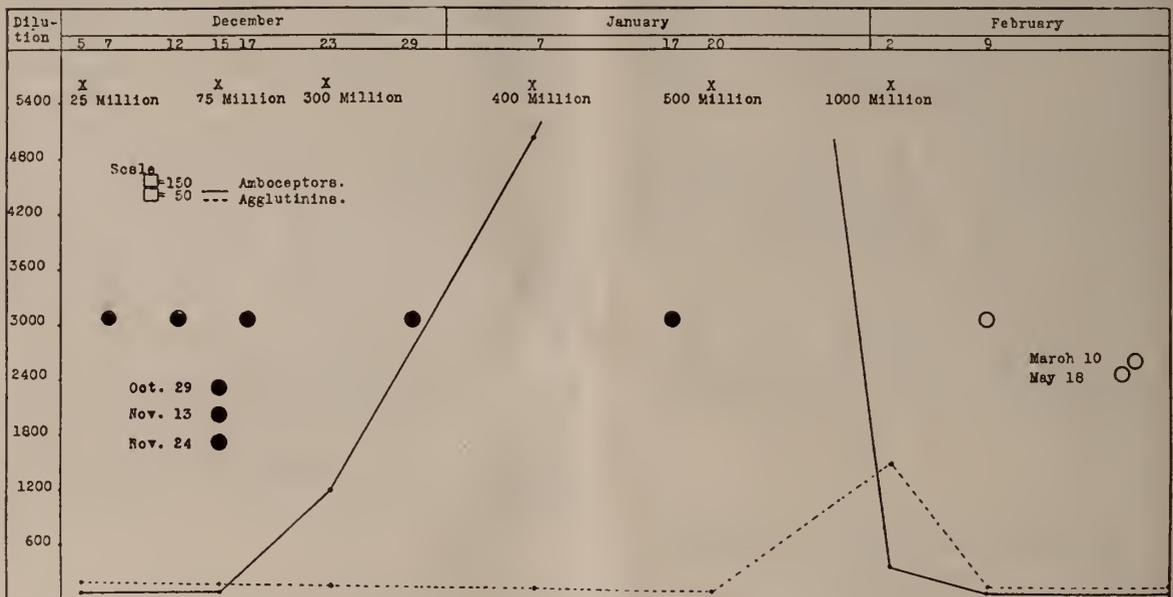
ent in about the same amounts as in normal persons at first. After an interval they increased rapidly up to at least a bactericidal titre of 16,000. My technique did not permit me at the time to determine how much higher. But, it was very much above this. Then it suddenly dropped and came to normal. Subsequent to this rise and fall in the amboceptor curve the organisms disappeared from the stool. The patient was followed for a year when she died. An examination of her gall bladder showed no evidence of typhoid bacilli.

It was my privilege to repeat this work last summer on a patient of Dr. Lewis Twining's of Borodino, N. Y.

Chart III. The phenomena has repeated itself in this case. Following a high bacterial amboceptor content the patient's feces became clear

CHART II.

DIAGRAM SHOWING CHANGE IN BACTERIAL AMBOCEPTOR IN THE BLOOD OF A TYPHOID CARRIER DURING IMMUNIZATION WITH AUTOGENOUS VACCINE. PATIENT OF DR. JOHN BUETTNER, SYRACUSE, N. Y.



These amboceptors can be increased in the blood of normal people. This is the basis for the result obtained by prophylactic vaccination against typhoid fever. Now, if the patient is a typhoid carrier, what effect will an increase in the amboceptors for typhoid bacilli have on the typhoid bacteria harbored in the body of the patient? That is the question at issue.

Two years ago it was my opportunity to study the blood of a carrier during a course of immunization. This was a patient of Dr. John Buettner of Syracuse. Chart II. The black dots represent the stools in which typhoid bacilli were found. The rings represent the stools in which they could not be found. The initial dose of vaccine was 25 million. The next 75 million. The next 300 million, then 400 million, 500 million, and 1,000 million. The amboceptors were pres-

ent in about the same amounts as in normal persons at first. Since December I have not been able to find typhoid bacilli in her stools. It has been found clinically that patients may clear up spontaneously for periods of a year or more so that I am not able to make the statement that the patient is cured, but it looks suggestive.

At the present time we have under treatment a patient of Dr. F. W. Smith's of Syracuse. When found an estimation was made by Dr. W. W. Waite that there were 7 million typhoid organisms to the gram of feces. The organisms are still in her feces. The immunization has been interrupted by a pregnancy. The amboceptors have not yet become sufficiently numerous, but now appear to be increasing rapidly, as can be seen by the chart.

Chart IV. There are several interesting points in regard to the successful treatment of these

of typhoid carriers the best results apparently have been brought about by immunization.

At the present time, the treatment of a case should begin with 100 million typhoid vaccines subcutaneously, and at intervals of two weeks, the dose should be repeated increasing by 200 million each time. If a cure does not come in 12 weeks a study of the anti-bodies in the blood should be made, to determine if they are being influenced by the treatment.

NOTE—June 24, 1912.—Since preparing this paper a few more observations on Dr. F. W. Smith's case are important. April 19th gave 2,000 million typhoid vaccine. June 1st a stool was examined, no typhoid organisms were found. June 13th a sample of blood was found to have a bactericidal titre of 1,600. The bactericidal power of the blood has apparently passed the peak which should now be indicated on Chart IV.

Discussion.

DR. CARLES F. BOLDUAN said: There is reason to believe that some three to five per cent. of persons convalescing from typhoid fever become bacillus carriers. In this state, where we have from 5,000 to 6,000 cases of typhoid fever annually, this means that each year some 20 or 30 new typhoid carriers are added to the already large army menacing the public health.

What shall be done with this large army of typhoid carriers? It is all very well to say that typhoid carriers shall not be allowed to continue in certain occupations involving the handling of food sold to others. That, of course, should be guarded against. But investigations have shown that this carrier condition is about five times as frequent among females as among males, and the women, particularly as housewives, thus constitute a grave menace to the other members of the family. You may be able to get a milk concern to dismiss an employee who is found to be a typhoid carrier, but a man will hardly "fire" his wife under like circumstances. Obviously, what is needed is some efficient method of treatment.

Before passing to the very interesting work described by Professor Meader, I want to say that it is not an easy matter to determine whether any given method is really efficacious in curing these individuals, owing to the marked intermittency with which the carriers may discharge typhoid bacilli. After discharging bacilli almost constantly for weeks and weeks, a carrier may suddenly cease discharging them, without any apparent cause, for a considerable interval, and then as suddenly resume. I have observed cases of this kind which intermitted five and six months, and the literature contains reports of cases in which, without any treatment whatsoever, there was an interval of over three years between the periods of discharge.

Of the various methods of treatment tried, the one practised by Professor Meader is perhaps the most logical, and as you have learned, has been attended with success in his hands, I

cannot help pointing out, however, that failures with this method have been reported, and that we should therefore look more closely into the conditions giving rise to the chronic carrier. Until this is done, the vaccine treatment of typhoid carriers will rest merely on an empirical basis, and that is rarely productive of the highest scientific results. Apparently in some cases something more than a mere bacterial immunity is concerned, otherwise why the preponderance of females among the chronic carriers? Possibly an anatomical factor is involved. We would, of course, not influence this by raising the bacterial immunity. Moreover, it is conceivable that in some cases the typhoid bacilli exist merely as saprophytes in the fæces, and thus are really outside of the body. It is difficult to see how an increase in the bacterial immunity of the tissues would have any influence on such bacilli.

The fact that success has attended Professor Meader's treatment shows that an increase in bacterial immunity is the essential factor in some of the cases, and in view of our present helpless condition with respect to typhoid carriers I feel that this method should always be tried. The laboratory worker, however, must address himself to the problem as to what factors are concerned in those cases which have thus far failed to respond to vaccine treatment, and must seek to devise an effective method of treating them.

The studies undertaken by Professor Meader attack one of the most important problems now confronting workers in preventive medicine. The effective treatment of typhoid carriers will undoubtedly mean the saving of a large number of lives and will mark an achievement hardly less important than the discovery of diphtheria antitoxin.

ARSENIC AND DIGITALIS IN PULMONARY TUBERCULOSIS.*

By A. JACOBI, M.D., LL.D.,

NEW YORK CITY.

IN the old literature some one may have met with the same subject and the same title. It is not my fault, but that of your Chairman, who insisted upon my entertaining you again with that topic. He suggested that some fellow, though a regular frequenter of these meetings, might have forgotten that in 1884 he was present when I spoke on the same subject with the same heading. He said it would bear repetition, anyway, because, for instance, neither the spontaneous tendency on the part of tuberculosis to exhibit an occasional recovery, nor the thousand and one remedies, and suggestions, and sanatoria, had succeeded in exterminating tuberculosis, and that it would be worth while, after all, to listen to what nearly thirty years after my communication of a rather mature experience I might have

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

to say on one of the drugs which quite often yield favorable results. Particularly was he emphatic on what appears to be a fact that some people, we doctors amongst them, are given to expect a single drug or method of healing, medicinal or physical—as if indeed there were a contradiction between the two—to be successful. He was so earnest in his complaints of our failures to deal with and cure tuberculosis; of the unsatisfactory condition of our indications and our results; of the limitations of our horizon which gives us only partial and narrow views; of our satisfaction when we boast of our accomplishments after repeating the uniform talk about air when the patient has a pittance of a hundred cubic feet per head; of rest, when the poor fellow must work unless he means to starve himself and his children, and of simple and nourishing food which he does not even know by sight; of Colorado when he has no nickel to cross the ferry; of sanatoria and hospitals, overcrowded or inaccessible, that give him beside the memory of his starving family in the tenement, no comfort nor health; of public institutions that are chartered for the purpose of indeed furnishing unattainable air and rest and food, but no medication for sleeplessness, or cough, or temperature. So he thought it was my duty to suggest at least one or two means to relieve the dearth of measures to be taken against some of the ways in which tuberculosis kills off our population.

If what I have to say is a rehash or a repetition, I might be consoled by the fact that the eternal repetition of fairly successful medication is preferable to the eternal repetition of the destructive working of tuberculosis.

If there be any medicine which, besides quinine and mercury, has been called a specific in many diseases, it is arsenic. It is known to act as a poison, and a strong caustic. It prevents putrefaction, though as a real antiseptic it ranks even below salicylic acid. It acts very favorably in malaria, chronic skin diseases, and maladies of the nervous system, and has considerable and sometimes unexpected effects in the treatment of lymphoma, even lymphosarcoma. In small and frequent doses it improves connective-tissue growth, it thickens the connective tissue of the stomach, and increases periosteal and osteal deposits. In the latter respect it is surpassed only by phosphorus, on the curative effects of which in subacute and chronic bone diseases I read a brief paper before you a number of years ago. Arsenic is also said to improve the sexual desire and power, and the physical courage of animals. Thus there is a variety of effects, the uniform cause of which remains to be explained. It can be traced back only, it appears, to the action of the drug on the cell. It is true that the different organs mentioned have cells of different structure, appearance, and function. But in regard to their nutritive processes the different varieties do not differ at all. (At all events oxygen acts

on all of them in the same manner, albumin is absorbed by them all, and osmosis regulates their circulation equally.)

The increase of cell growth in all the tissues mentioned points to the mode in which arsenic is effective. It cannot accomplish what it is known to do, without local stimulation and irritation, which when moderate improve growth, when exaggerated (by large doses or in predisposed persons) lead to granular degeneration.

Its action, as long as it is restrained within certain limits, has been utilized by Hans Buchner for practical and theoretical purposes. The former consists in its administration for phthisis, the latter in the attempt to fortify the bacillus theory. In his belief phthisis can be prevented by arsenic keeping out the bacillus. This is done by stimulating and gently overnourishing the cells, and thereby increasing the power by which the organism resists the invasion of the bacillus enemy. His theory is, however, more doubtful than his results. He relies on arsenic as his main medicinal resort in phthisis, and finds fault with Isnard only because this author, in 1867, used arsenic for curative only, and not for preventive purposes. In this remark lies the explanation of the effect which I claim myself.

If preventives be thorough, phthisis will remain dormant. That effect is accompanied by rational dietetics, climatotherapy, and finally by arsenic. I know it has been used formerly in that diseased condition called consumption, but the reports of new experience do no harm. Contradictory reports prove nothing, for where two do the same thing, it is not the same thing after all, and the method of administration of a drug is more important than the mere drug. Under the permanent use of arsenic the infiltrations diminish, elastic fibres disappear from the expectorations, the strength improves, and the body weight increases.

Of this result I have convinced myself in a great many cases while they were in the incipient stages.

Hans Buchner asserts that the incipient stage is not the only period in which arsenic proves effective. That is true. It has the same, or rather a similar, beneficial effect in the later stages. But he claims that complete recovery has been accomplished in the most severe cases, that perspiration and fever will cease, the pulse become less frequent and stronger, and the vital capacity increase even in far-advanced cases. This I believe to be rather overdrawn. Particularly in regard to the hectic fever I have almost always been disappointed. I believe that even digestion was not at all improved by arsenic in that stage. Thus it has become my rule not to prescribe arsenic at all while the fever is very high, but to begin or return to it as soon as the temperature has a tendency to become more normal. When I acted on that plan I had very often the satisfaction to im-

prove the condition of very doubtful and far-advanced cases.

The doses ought not to be large. Nausea, colic, diarrhœa, œdema of the eyelids, are temporary contra-indications to the continuation of its use. One-fifteenth, or one-tenth to one-sixth of a grain of arsenous acid, daily, is a sufficient dose for an adult if it is to be continued for a long time. In order to render it less liable to give rise to disagreeable symptoms, a little opium may be administered with it. In most cases of incipient phthisis this combination is pleasant and useful. In such as show diarrhœa at an early period, its joint administration is a particularly happy one. Still, it may be remembered that gastric symptoms, attending the use of arsenic when first administered, will be apt to disappear soon. It may also be remembered that with us tuberculous diarrhœa is less frequent than it seems to be in Europe.

The preparations I use are either arsenous acid or Fowler's or Pearson's solution. It is best to give the former as a pill, in such combinations as I shall allude to shortly. Fowler's solution, three drops, or Pearson's solution, six to ten drops, three times a day, in a few ounces of water, administered after meals and gradually increased, will act favorably. In but few cases the former had to be exchanged for the latter, because of the intolerance of the stomach. That it enhances growth, every physician and every veterinarian knows perfectly well. The favorable effect of arsenic is mainly noticed in incipient but well-marked cases. But in later cases also, I cannot say that I found a contra-indication to arsenic in advanced cases unless the fever was too high and the digestion badly impaired. Such conditions may advise against arsenic, but temporarily only. But as a rule, the very indication for arsenic is rarely wanting in pulmonary tuberculosis, for the lung is not engaged in a *uniform* and persistent destruction of its tissue. Alongside the formation of abscesses, with their staphylococcal fever, there is cell irritation going on and the necessity of utilizing it for the purpose of increasing its resistance. You will remember that when tuberculin was extensively used in 1891, it was believed that its effect would consist in the rapid proliferation of cell membrane and interstitial tissue which was expected to fortify the general tissue and to encapsulate the bacillus. Tuberculin did not do it, but *arsenic does*. But as you want its action to be persistent, give small doses, continually. (The organic preparations of arsenic do not exhibit their effect in the same way as the inorganic. The organic constituent is destroyed in the organism, and the inorganic elements freed. Atoxyl and Ehrlich's 606 are not of this simple composition; their indications lie in different directions. At all events, my experience or knowledge is not sufficient to consider these latter in this practical discussion of tuberculosis. The organic compounds I have just referred to

affect the protozoa directly and leave the tissue inviolate. It may happen, however, that the destruction of the protozoa is not complete, mainly when the doses were small; in that case disease,—such as chronic malaria and syphilis,—may relapse. On the other hand, arsenic in organic combination may have a cumulative action, such as peripheral neuritis, enteritis, even blindness, which has been noticed even after the administration of atoxyl. But while I have given arsenic in thousands of cases of nervous and infectious diseases, I have observed no sequelæ except œdema, enteritis, dermatitis, or moderate neuritis.)

The effects,—either morphologic or functional—of arsenic are not very distinct in the beginning of its administration, but it surely may have a cumulative action; for the cell substance being slowly poisoned, its life becomes extinct; it degenerates. The influence of arsenic is probably chemical. Bertrand found arsenic as part of every living cell; even in the yolk of eggs (some also in the white), to the amount of 1-200th of a milligram. It surely has a great effect on growth in general; adipose tissue, muscle, bone, periosteum, and connective tissue will increase; blood and hæmoglobin are probably affected in the same way. Nitrogen is retained in larger quantity, albumin increases in the whole organism. But from what we know of the local effects of chronic arsenical poisoning, we have to conclude that it works for good or bad principally in the active cells of the liver, the kidneys, the capillaries, and the blood. Exactly as in the case of phosphorus, it is by either small or too big doses, when administered a long time, that either normal growth or morbid degeneration is caused by arsenic. That is why it may be made equally efficient when either feebly developed organs are to be strengthened and enlarged, or pathological new formations and parasites are to be destroyed. Thus, general debility, malacia, lymphoma, sarcoma, leukæmia, syphilis, pseudo-leukæmia, malaria, and other parasitic diseases,—such as sleeping sickness, relapsing fever, pellagra,—have been found to furnish their different indications for the use of arsenic in proper combinations. It has no therapeutic effect unless combined with oxygen (contrary to what we know of phosphorus, which has its effect in the bone as a free uncombined element only), or as an arsenite of potassium or arsenite of sodium, or as arsenous acid, properly called arsenic trioxide. As a rule, it may be given for a long time without bad effects. To prevent its effect on the gastric glandules,—which have been known to become atrophic during its use,—some hydrochloric acid should be given regularly; or black pepper should be given with arsenic on account of its acid producing action, in the shape of Asiatic pills.

Many of my cases took at the same time arsenic and digitalis in some form or other. Of them, I had reported to the Medical Society of the State

of New York in 1884. Is that combination advisable, more so than a single drug? It is pleasant to the observer, who bears no risk, to give a single drug only or to follow a single method only, but the sick person is more interested in his welfare and safety than in the doctor's comfort and actual or alleged scientific interest. In our relation to the sick we are physicians, not naturalists.

The latest writer on arsenic and incidentally on guaiacol, in connection with the subject of tuberculosis is Robert Brunow, as assistant in the Pharmacological Institute of the University of Innsbruck. He has experimented on animals in order to ascertain whether there is a specific effect of this drug, or whether it merely changes the physiological action of the organs of the animal. His drugs were a combination of a three per cent. solution of potassium and sodium guaiacolate and 1.5+ potassium arsenite 1 centigram, which is the equivalent of Fowler's solution, one gram. His results were an increase of weight of the animals when he fed arsenic, of appetite and diuresis when he gave them guaiacol. Colonies of tubercle bacilli would grow on glycerin-agar, though it contained guaiacol and arsenic. Three rabbits were infected with tuberculosis through ear injections. One had been given the guaiacol-arsenic preparation some weeks before the injection, and the drug was continued twelve weeks. The rabbit did not lose weight, but increased 100 grams, toward the end of that time. The second was treated in the same way, received the drug after the injection, became first emaciated, but recovered its original weight about the tenth week. Both were killed after the twelfth week and exhibited nothing but a few tubercular nodules, mainly at the point of injection. The third rabbit received no drug, and died in seven weeks of pulmonary tuberculosis. Result: *the animals withstood tuberculosis when fed on guaiacol and arsenic.*

Three guinea pigs were infected through the peritoneum. One was given the guaiacol-arsenic preparation before, one after infection, the third not at all. This one died after three weeks of peritoneal tuberculosis, the others were killed and exhibited a very moderate infection. Three other guinea pigs were infected subcutaneously. One was treated with drugs two weeks before. Its weight decreased, but became normal after eight weeks. The second was treated some little time after infection. Both were killed, and exhibited a tubercular infiltration at the locality of injection. It was mixed with connective tissue. The third was not treated and died after some weeks of generalized tuberculosis.

His general conclusions, based upon his experiments, are, in regard to arsenic, that it has a specific antituberculous action. Through its effect on, and the elimination of nitrogen, guaiacol has no such effect, but it increases the appetite, and increases toxalbumins, it relieves fever and

perspiration. This latter is a property which has been ascertained during these more than twenty years.

The favorable results attained by Burow are contradicted by L. Nürnberger in the same journal, the *Münchener Medicinische Wochenschrift* 1911. Perhaps this is due to the modern precipitancy of literary production, when you consider that Burow published his paper in No. 34, on page 1792, Nürnberger in No. 50, on page 1912—all within three months. Nürnberger says that in the test tube his tubercle germs were not killed by arsenic, and for that reason he resorted to animal experimentation. He produced tuberculosis of the iris and of the peritoneum, and used arsenic before and alongside the treatment, or without any. In his analysis he found tuberculosis in the liver, spleen, and ascites. That is why he concludes that fair doses of guaiacol and potassium arsenite do not hinder the growth of tuberculosis in glycerin agar, when either used by itself or in combination. The same experience was attained in the living animal. Nürnberger refers to previous observations of other authors. While Hans Buchner recommended it very warmly, Stintzing and Leyden denied any specific effect. The same was found in regard to guaiacol and creosote, which were credited, however, with general improvement as to appetite, cough and sputum. After all in the first number (January 2) of 1912, Burow defends his former position against the assertions of Dr. Nürnberger by stating: first, that his investigations were made in the hygiene Institute of the University of Innsbruck together with and under the control of its director, Professor Ballner; second, the cultures were those of bacillus of the human type and did not come from cavities from which, as a rule, only mixed infections can be obtained; third, the observations were many and of long duration, the animal experiments very numerous and always direct;—not intermediate,—that means after a passage through other animals. The animals treated with guaiacol arsenite remained alive. They were killed for the purpose of the autopsy only. There was no difference between the autopsy results, whether the treatment began before or after the infection with tuberculosis.

It appears legitimate for Dr. Burow to ask why, in spite of all his doubts, Dr. Nürnberger hopes after all for the discovery of a synthetic arsenic preparation. What I am quite sure of is that I have used arsenic in my treatment of the tuberculous these more than fifty years, and that I have tried to observe correctly and in many thousand cases. I am sure I have had success, else I should not stand here. During the last half century, I have also noticed reports of experiments which failed, others which were contradictory, or negative. That was so in antibacteric times; it is so now. What you or I experience in thousands of instances should not go for naught, though no one is infallible—neither

our teachers nor our pupils, nor ourselves. I do know that my patients do well during the protracted administration of arsenic. If you are careful, you may be satisfied with not seeing your patient oftener than every five or twenty-five weeks. So your treatment is surely not harmful.

What is the rôle of digitalis in the treatment of pulmonary tuberculosis? Here it exerts its influence, as in other conditions, when it is indicated. It contracts the heart and the arteries, increases blood pressure, nourishes the tissues—including the heart itself;—it should be avoided in its acute inflammations only, or in those myocardial changes which bear no strain. That is why the doses should be adapted to the indications. I have to refer you back to what has been written for you in your Transactions of 1884, and again in a paper on "Prolonged Medication, with Special Reference to Digitalis," in the *NEW YORK MEDICAL JOURNAL* of 1902. You know all about the cumulative effects of digitalis. They are avoidable. Be sure not to use preparations which are not immediately soluble in water. If you do, the drug may not be absorbed at once, but in a larger bulk than you premeditated, and be sure to stop large doses when given in acute dilatation of the heart and cyanosis and acute pulmonary œdema after you have accomplished your end. This peculiar indication of giving small doses a long time in succession I have discussed in my lectures twenty-five years before I had an opportunity to appear before you, in 1884. That it was not generally adopted or appreciated, is not your fault, nor mine. In Germany, it was suggested as late as 1899 (17th Congress for Internal Medicine), frowned down for several years, and finally appreciated. That such drugs as mercury, iodine, phosphorus, thyroid, thymus, supra-renal gland, indicate and require prolonged administration, is established and accepted. Thus digitalis may be given for months and years in appropriate doses—to an adult, three or five grains daily—for months or even years in chronic heart diseases, with beneficent effect only. That is easily understood by whosoever acknowledges that it is worth while to be patient and persistent when the disease is obdurate. Doses of digitalis may thus be found efficient in chronic anæmia and chlorosis, when the circulation requires stimulation, for its tonic effect, in connection with arsenic or iron, or nux. In pills, such medication is easily, readily taken and digested.

CONCLUSION.

It is a grave mistake to believe that tuberculous patients should be directed to rely solely on air, rest and food, to the exclusion of drugs.

Such physical measures do not cure patients with restricted means, or those really poor, and anxious, and sorrowful.

Sanatoria which pride themselves on refusing medicinal aids, are not successful.

So-called symptomatic drugs, camphor, opiates, etc., are helpful and indispensable.

Arsenic should be given for months and years. I never treat a pulmonary tuberculosis without it. I seldom give it without a small dose of digitalis. I never give it without a guaiacol salt. My routine has been the carbonate. Many prefer other salts, which are sold under the names of styracol, or thiocol.

THE PROPER DOSAGE OF AIR, FOOD AND REST IN PULMONARY TUBERCULOSIS.*

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I FEEL as if I owe this society an apology for bringing before it a subject so threadbare as the treatment of pulmonary tuberculosis by fresh air, good food and regulated exercise. It seems wise, however, to examine from time to time in the light of our progress even the most widely accepted and most revered medical precepts. "Hospitalization" for the attending physician, the interne and the nurse, and "routine treatment" for the private practitioner, offer paths easy but dangerous alike to him who prescribes and to him who follows. Nowhere is this better exemplified than in the treatment of pulmonary tuberculosis.

The last half of the 19th century saw the institution of the fresh air treatment of pulmonary tuberculosis, which in the first decade of this century has been extended to the treatment of many other diseases, including nervous and mental disorders, pneumonia and certain digestive disturbances. We know fresh air greatly benefits pulmonary tuberculosis, but even yet some of us have not fully realized that fresh air benefits other forms of tuberculosis as much as it does the respiratory type. It is then safe to say that fresh air exerts no more influence upon the lungs than upon the rest of the body. A further fact bearing upon this point is the unpleasant symptoms that many persons experience when confined in a close or stuffy atmosphere and forced to breathe "ruminated" air. It is almost needless to enumerate these symptoms, at first headache, drowsiness, lassitude, malaise, nausea, faintness, vertigo; later digestive and nervous disturbances, followed by malnutrition, secondary anæmia and lessened resistance to infectious diseases. It is of considerable interest to recall the symptoms of mountain sickness experienced in very high altitudes (15,000 feet)—headache, intense drowsiness, lassitude, nausea or even vomiting, fainting, vertigo and further palpitation of the heart, throbbing of the arteries and shortness of breath.

Putting two and two together, it would seem very reasonable to infer that lack of oxygen in

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

the latter case was the cause of the disturbance, and arguing by analogy it would appear most probable that lack of oxygen was the disturbing factor in the former. Such certainly was long a current belief. The increased percentage of the CO_2 has been held by some to be the chief cause, while others have believed that "crowd-poison" was the essential factor. The existence of "crowd-poison" has been questioned, but Rose-nau and Amos have proved beyond doubt, by the anaphylactic reaction, the presence of protein bodies in the exhaled air.

Are these then the deleterious substances that weaken resistance to and lessen chances of recovery from pulmonary tuberculosis when the patient fails to get fresh air? Ingenious experiments have been devised to help answer this question. Several healthy men have been confined in small cabinets and made to rebreathe a small amount of air. The percentage of oxygen quickly fell and that of CO_2 rose greatly. The organic matter, which apparently bears some relation to the percentage of CO_2 , must also have arisen. The individuals all became very uncomfortable and finally ceased to talk. An electric fan inside the cabinet was then set in motion and great relief was experienced even though the composition of the air remained unaltered. In another experiment the individual within the cabinet was allowed to breathe fresh air without, however, experiencing any relief. Still again, a person outside the cabinet was permitted to breathe only the air within the cabinet and suffered no ill effects. These and other careful observations have led to the conclusions that coolness, dryness and active motion of the air are factors to be sought after, and further, as James puts it, that "many atmospheres are good enough to be breathed which are not good enough to be lived in."

The temperature of the air plays an important role in health and disease. Recent inquiries concerning certain mill operatives in Connecticut have shown that men working upon piece work accomplished more when there was a marked change in the atmospheric temperature even from cooler to warmer conditions. As a rule the more vigorous races live in climates where the cold, though pronounced, is not severe enough to limit the production of good crops. The custom of sending young and vigorous patients to climate with equable temperature has long since been abandoned. An average diurnal variation of at least 20 degrees F. is one requisite of a good health resort for tuberculous patients. Sudden changes for vigorous patients act like a tonic and are to be desired when intelligently met. This is a feature of the winter climate in Arizona, where a marked change occurs each night at sunset. The weight curve of healthy and tuberculous individuals bears this out. In 1,200 patients at the Adirondack Cottage Sanitarium I found the weight began to increase in August and continued

to do so until Christmas. It then remained stationary or decreased slightly to Easter, when it fell steadily to August. A marked change of temperature is usually noticed in the Adirondacks in August and early September and the diurnal variations are great. I might add that this is probably the normal weight curve. Nearly every tuberculous patient has a more or less deranged nervous system. Like cold tubs in typhoid, cold air in pulmonary tuberculosis is a great nervous sedative, for it abstracts heat, especially when in motion. Too intense or too prolonged cold, however, over-stimulates some. It has long been a current belief in Saranac Lake that one hour of driving was worth two of sitting on the porch. Who can say that, beside the psychic influence, the rapid change of air about the body may not be greatly beneficial? Unquestionably the exhilaration of coasting and of automobiling may in part at least be explained in this way. In any case, to active motion of the air with the attendant evaporation of moisture from the surfaces of the body, is to be ascribed much of the sensation of well being experienced from good ventilation. It requires only slight movement of the air to increase markedly the loss of heat from the body. In cold climates this must be met by heat-production, by muscular contractions, which when the patient is at rest are involuntary but greatly raise the muscular tone.

The dryness of the atmosphere, that is, the degree of humidity relative and absolute, plays an important part, but can be largely offset by motion of the atmosphere. Mere dryness is of little avail, for nearly every home in America, especially in winter, has an atmosphere containing far too little moisture—in fact, far less than is to be found in the deserts of Egypt or Arizona. The really important point is the amount of moisture that can be absorbed by the atmosphere from the surface of our bodies, and this depends upon the humidity of the air, its temperature and, most of all, upon the movement.

This brings us to the consideration of a few practical points in the fresh air treatment of pulmonary tuberculosis. It might seem wholly insufficient, from what I have said, for a patient to be in bed with his head out of a window. In reality it is not so; but in my opinion it is far less effective than the full air bath. Spraying the upper part of the trunk with cold water in typhoid fever is certainly not as efficient as a complete sponge, but does some good. So with the window tent. It must not be lost sight of, however, that the room in which the body remains needs very careful ventilation.

A question that must be decided frequently is, whether the roof or the back yard is the best place in which to take the fresh air treatment. I do not hesitate to say that the roof should be used in every instance, where possible, for sev-

eral important reasons. The number of bacteria, the quantity of dust and the temperature of the air, decrease directly with the elevation above the street, while the movement of the air increases. This leads to fewer secondary infections and to less irritations of the respiratory tract, and subjects the body to a far better hygienic environment. In summer, however, the roof may be too warm.

These newer ideas about fresh air throw grave doubts upon the efficacy of air carriers and emphasize the necessity of life in the open, "living" air. My experience after observing patients for ten years does not lead me to believe that sleeping out of doors materially hastens recovery, provided eight to ten hours a day are spent in the open air and the night passed in a well-ventilated room; when, on the other hand, the patient returns to his indoor work, then sleeping out is very necessary. Ozone is said never to occur in rooms however well ventilated, but it is of no value to man except as an indicator of the purity of atmosphere.

A man out of doors is said to be exposed to one hundred times more fresh air than he could get in the best ventilated room in any given period of time. In any room bacteria are partially protected, while in the open they quickly die.

GOOD FOOD.

"Eat once for yourself, once to gain weight and once for the germs," is another way of stating that suralimentation is of importance in the treatment of tuberculosis. But just how important is suralimentation? What are we striving for? We saw that life in a poorly ventilated atmosphere had a deleterious effect upon the digestion and ultimately reduced the resistance to infectious diseases. The environment in which patients with pulmonary tuberculosis were treated twenty-five years ago made it almost impossible for them to escape the effects of an ill-ventilated atmosphere. Their appetites suffered and they could not eat. It was but natural then that along with fresh air, food, good in quality, great in quantity, should also be insisted upon. That day, however, has now passed and any layman that does not know that fresh air and good food constitute the best treatment for pulmonary tuberculosis is indeed unobservant or crassly ignorant. What indeed are the purposes of this good food? Is it enough to keep the patient in nitrogen equilibrium or does he require more and if so how much more? Of what should his diet, roughly speaking consist? These and many other problems have received much attention during the past decade and it is of great interest and value to round up our new knowledge on these points. Given a patient without fever and without (serious) complications, the scales are the best criterion of the diet. I know of no better simile than the gasoline en-

gine. The efficiency of the engine is the work it can accomplish on the road. Give it too much gasoline and the combustion is incomplete, the spark plugs become dirty, the cylinders coated with carbon, and the efficiency is greatly reduced. In other words, the engine does far better work when supplied with only enough gasoline to produce the best result. So, too, with the tuberculosis patient. Give him what he can use but reduce his diet to the lowest point at which he will gain the required amount of weight. The tuberculous patient with an early lesion is often about ten to fifteen pounds below what he should weigh for his height and age. We should, I believe, aim to bring this patient up to and slightly beyond this weight, which is often ten pounds above what he has usually weighed. Do not try to do this, however, by too rapid gains, too forced feeding, which but too often defeats its very purpose. Be satisfied with a gain of a pound a week and a digestive system in fine order. Now when the required weight is attained, reduce the diet to the lowest point which will give satisfaction at the table and sustain the weight. This reduces the quantity of waste which the excretory organs must take care of to a minimum, makes out of many patients very different individuals and reduces greatly gastro-intestinal disturbances. You may ask me for details as how best to accomplish this. Here arises the question of individuality which is really of the greatest importance. My first advice to such a patient is gradually to quit taking milk and to eat only three meals a day. These meals should gradually be made to approximate what he must eat in the future. Fats are more easily taken in sufficient quantities than proteins or carbohydrates, but popular knowledge so emphasizes the importance of proteins that it is more necessary to emphasize the carbohydrates.

In the majority of patients beginning treatment for the first time, such directions smooth the course of recovery from the disease. In some, however, the digestive functions have never been very active and these patients must be coaxed and wheedled into eating an amount sufficient for their needs. Here we must have frequent days of rest, when the diet is somewhat reduced. The greatest objection to sanatorium treatment is the difficulty experienced in individualizing the diet. I cannot today, however, go into details of how to treat digestive disorders. In closing this section of my paper, I might add that my advice to patients is as follows: "Eat as little as you can in order to gain, but you must gain this number of pounds. When you reach that weight, eat less still and just enough to maintain your weight, avoiding milk. You will have little upsets, little flare-ups of the disease, during which you will lose weight. Then the milk which you will have cut out of your dietary when you have gained enough, should be replaced and will enable you to regain quickly

the pounds you have lost. It is not the amount you eat but what you assimilate that is important."

REST AND EXERCISE.

Too much body fat is no aid in combatting an infectious disease, and when the weight reaches the mark set, then another problem enters, which I shall now discuss. I refer to exercise. By inference you will conclude that up to this time the patient has been at rest. Generally speaking, the weight, temperature and pulse should be normal before any exercise is permitted. Recently two schools have sprung into prominence, one advocating absolute rest, the other maintaining that the only way to lose the cough and expectoration is by carefully regulated exercise which produces efficient auto-inoculation, a *sine qua non* of recovery. One advises that the patient's trousers be hid, for then you know where the patient is; the other says that the muscles must be hardened from the first in order to achieve results. If we weigh these opinions we see that while danger lurks in the first, grave risk is associated with the second. While rest may be employed in any home, the system of auto-inoculation can be efficiently and safely carried on only in an institution where the physician in charge is well and believes thoroughly in the system. Many have attempted it and some have come to grief. My advice to you is to beware of auto-inoculation unless you stand ready to do nothing but work alongside your patients. This is obviously impossible for most of us.

In any case, rest is imperative for many patients for some time, and those who advocate auto-inoculation through strenuous exercise believe firmly also in rest. In fact, some believe in rest so absolute that the patient with fever is not allowed to stir from his bed—he can neither read nor go to the toilet. He is fed, bathed, and treated as a patient ill with typhoid fever would be. This absolute rest is prescribed to prevent auto-inoculation and when it can be carried out intelligently and faithfully may reduce a temperature that has long resisted all other treatment.

But say the temperature has reached normal, what should be the next step? It is here that the two camps are divided, for one would, as I say, hide the trousers, the other assist the patient to don them.

In regard to auto-inoculation, I confess it is a great temptation to all sanatorium authorities to push it. The big, husky fellows, the robust, buxom lassies, that sit about on porches or stroll around taking their exercise, possess much potential energy that it is a great pity to lose. This alone is a strong argument in its favor, but to make it a success, there are certain requirements that are difficult to obtain. As I have said, I believe that to achieve the best success, the phy-

sician must be well and strong and willing to work with the patients if necessary. In an institution it is very difficult to carry on other forms of treatment, but this can be overcome. Excessive auto-inoculation must be met by absolute rest, and few institutions have a nursing staff large enough to give the patients proper treatment. A certain number of patients fail to improve under this line of treatment and some feel that they have been injured. This, however, can be disregarded when due care has been exercised. Another unfortunate thing is the fact that even in the Adirondacks it is often too hot in the middle of the day for patients to work in the garden or fields. Crops mature and need to be reaped. The patients for one reason or another may not, without serious injury to their chances for recovery, be able to garner them. Shall the crops be lost or the patients injured? Such a problem is not infrequent. While it may not be perfectly fair to compare the results obtained in a sanatorium in England with those obtained in one in America, the comparison affords some interest. The results of such a comparison between the figures published by Paterson at Frimley, the birthplace of auto-inoculation, and those at the Adirondack Cottage Sanitarium, where a certain number received tuberculin treatment, seem to indicate that the permanent results may be better among the patients discharged from the latter institution. In any case, I believe the treatment by auto-inoculation in pulmonary tuberculosis is fraught with grave peril and I confess I hesitate to use it.

How to be happy in bed is a problem difficult of solution for many men and to attempt to keep a patient in bed who is fuming and chafing under the restraint when his temperature is normal and he feels well is, I believe, useless. I do believe we have overlooked the value of rest of the lungs in pulmonary tuberculosis, which I might add can be obtained with any degree of success only when the patient is in bed. We know that a tuberculous spine needs fixation, that a tuberculous hip needs absolute rest, that a tuberculous knee or wrist used ever so little fails to improve.

What aim has the treatment of pulmonary tuberculosis by induced pneumothorax other than limiting the function of the lung and putting it as nearly at rest as possible? I believe the day is coming when by this means and by other operative interference which put the lung at rest we shall prolong the life and usefulness of many patients who today have but a few months of dreary, useless and hopeless existence ahead of them. I have known two patients, one with a broken leg, the other with a tuberculous ankle, make pulmonary recoveries only when absolute rest in bed had become necessary on account of the complication. For these reasons I have come to believe that a patient with an early lesion and

any elevation of temperature should remain in bed for some time. Nor do I always limit it to patients who have a rise of temperature, for rest in bed will help the cough and expectoration more in many cases than any form of treatment. Digestive disturbances are often more readily combatted when to the treatment is added rest in bed.

You must of course use discretion for all patients cannot be so treated. When by rest in bed the temperature has fallen to normal and the question of getting up arises, I often inform the patient that the period of most rapid gain is from the time his temperature becomes normal to the time he begins to get up and to use his energy otherwise than for combatting the disease. This, for many, makes the bed a little softer resting place. When such a patient is doing well, I frequently allow him to go for drives or boat rides or even, when begun gradually, to exercise by walking. On his return he goes at once to bed on a porch where he lives and takes all his meals except in cold weather. At first, these liberties should be permitted only on every other day, and the following day be spent in bed. It is surprising what such patients can accomplish later who devote their whole time to resting and working.

When the patient knows that at a certain date he must return to work and if I consider such a step at all possible, I endeavor to fit him for his future work. At the Adirondack Cottage Sanitarium we have found our workshop of the greatest help in training the patient's muscles for his future activities. We teach them that unless they can do more work, take more exercise than is required by their future occupation and withal stand it well, it is folly to think of returning to work. For clerks, bookkeepers, mechanics, physicians, nurses and many others, we find suitable, useful forms of exercise which we prescribe, not with the idea of auto-inoculation but with the idea of producing tolerance to the amount of exercise necessary to their various callings. The patients enter into it heartily and I believe for us, at least, the results are far more satisfactory than those we could obtain by auto-inoculation.

Rest in bed is essential in all early cases for some time as well as for any patient that is not doing well. Rest harms few patients even when carried on longer than necessary. Exercise is often fraught with danger and must be prescribed as carefully as arsenic or strychnine, for an overdose is not less deadly.

Had I to begin treatment today for tuberculosis, knowing what I do, however little it may be, I would go to bed and remain there for two months, whether symptoms were present or absent. Such, I feel, is the importance of rest at the beginning of treatment.

A CLINICAL STUDY OF RELAPSES IN TYPHOID FEVER; WITH AN ANALYSIS OF 25 RELAPSES IN 21 OUT OF 166 TYPHOID FEVER CASES.*

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NEW YORK CITY.

I. *Introductory and historical; pathological nature of the relapse.*—In the early part of the nineteenth century there prevailed much confusion and a long controversy as to the identity or non-identity of typhoid and typhus fever, and in the studies which finally established the entity of typhoid fever and definitely determined its differentiation from typhus, the relapse played an important rôle. The first writer to report relapses in typhoid fever was Schultz,¹ who in an epidemic in 1830 at Zweibrücken, Bavaria, had observed three relapses in 55 cases. An epidemic of typhus fever in 1836 at Philadelphia was studied by Gerhard,² who first called attention to the absence of relapses in typhus. The credit for having established the pathological basis for relapses belongs to A. P. Stewart,³ whose autopsy performed in 1839 on an individual who had died of pneumonia during a relapse showed characteristic lymphoid infiltration and fresh ulceration of Peyer's patches as well as healed or healing ulcers. Part of the report of this autopsy is as follows: "Incomplete splenisation of lower part of right lung; diseased aggregate glands at the lower part of the ileum, some ulcerated, some going on towards cicatrization, others not ulcerated and in the state in which they are described about the sixth day of the disease."

II. *The relapse an important factor seventy-five years ago in the original differentiation of typhus and typhoid fever as well as in the differentiation of modified typhus and typhoid fever as these diseases now appear in New York City.*—In the classical article just referred to "On the Nature and Pathology of Typhus and Typhoid Fever Applied to the Question of the Identity or Non-Identity of the Two Diseases," Stewart says: "With respect to typhus, I have never, among thousands of cases, seen a single case of relapse, in the proper sense of the term, after the symptoms had begun to decline." After quoting Montault and Louis to the effect that relapses do occur in dothineritis, and after giving the histories of several relapse cases, Stewart states further: "After the facts which have been adduced, I feel almost certain to expect assent to the likelihood of the opinion, which, I am convinced, future observation will confirm, that in *typhus*, when uncomplicated with any secondary affection, a second attack does not take place, while in typhoid fever the contrary is the case."

Stewart's conclusions and predictions of nearly 75 years ago as to the practical non-occurrence

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

of relapse in European typhus are borne out by recent observations; in 18,268 cases of typhus fever reported during twenty-three years at the London Fever Hospital, there was only one relapse.⁴ G. A. Friedman, whose experience with typhus in Russia enabled him to recognize and identify the so-called Brill's disease as attenuated typhus, states in a personal communication:

"In a large experience with both epidemic and sporadic typhus I was never able to observe a relapse. On the other hand, I certainly have seen a repetition of the disease in two individuals, to which I referred in my article. But the interval between the first and the second infection in both instances was so long (one year in the first case, two years in the second), that a relapse could not be taken into consideration."

The rarity of relapses in Mexican typhus will be considered under the next heading.

Truly history has repeated itself in regard to the relapse, which has in our own times again figured prominently in the distinction between typhus and typhoid fever. In the group of affections which were at first regarded by some writers as a new disease of unknown origin but which were quite recently proven by Anderson and Goldberger to be identical with Mexican typhus, there were no relapses. To Brill⁵ belongs the credit for having first differentiated these cases from typhoid fever; later he proved also that they were distinct from paratyphoid fever and from typhoid-colon and Gärtner group infections. Though the original clinical recognition of the disease as attenuated typhus by G. A. Friedman⁶ of New York has been confirmed by the masterly experiments of Anderson and Goldberger,⁷ yet it had required fifteen years for the Board of Health and most of the physicians of New York City to be convinced that these cases were not mild, atypical or abortive typhoid.

Now again, as in the years from 1830 to 1840, the uniform absence of relapses in the non-typhoid cases has been an important factor in determining this differentiation. Relapses are more frequent in the abortive than in the ordinary type of typhoid fever, whereas in Brill's⁸ 255 cases studied at Mount Sinai Hospital there were no relapses. Ziegel^{10, 11} has reported 23 similar cases studied at Beth Israel Hospital with no relapses; and Louria¹² has reported 18 such cases observed at the Jewish Hospital in Brooklyn, with no relapses.

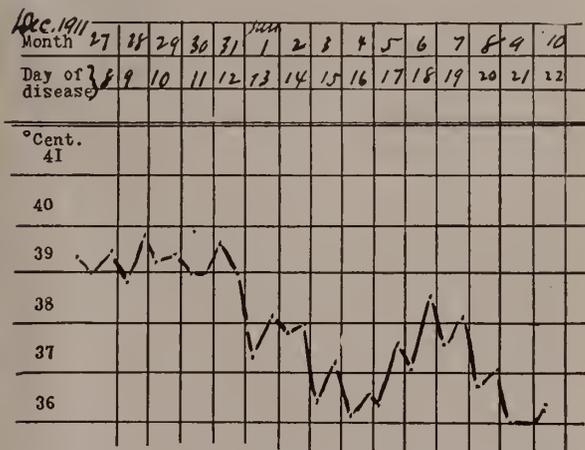
III. *Occurrence of the relapse in infectious diseases other than typhoid fever, viz., syphilis, relapsing fever, subacute infective endocarditis, and Mexican typhus; recurrences in scarlet and rheumatic fever.*—Comparable to typhoid fever so far as the relapse is concerned are syphilis, relapsing fever, and the subacute infective endocarditis of Libman and Celler,¹³ a study of the blood in which diseases shows that there can be a true septicemic relapse in an infectious disease without the supervention of a new infection.

From clinical considerations the recurrences in scarlet and rheumatic fever would appear to be analogous bacteriologically to the relapse in typhoid fever.

As to the occurrence of relapses in Mexican typhus, I wrote to Dr. Joseph Goldberger of the United States Public Health and Marine-Hospital Service, whose reply was in part as follows:

"With respect to relapses in typhus I can tell you but little from my own experience. I have seen only one instance of it. I enclose the fever chart of this case. You will note that after an intermission of 48 hours the temperature again rose and was up about 48 hours. Mexican friends tell me that relapses are extremely infrequent; my own experience is in harmony with this opinion. Similarly, although quite infrequent, second attacks may be observed. I saw one such case in his second attack in Mexico City last winter. The interval between attacks was four months.

"With reference to typhus attacks in the monkey, I can speak more definitely. In our work—Dr. Anderson's and mine—we have so far encountered two very well-marked relapses. In one monkey the relapse following an apyretic interval of 5 and in the other of 12 days; the former was a typhus following blood inoculation, and the latter was one following the bites of body lice. I think I showed these fever curves on the screen at the New York Academy of Medicine."



Temperature curve in a case of Mexican typhus with Relapse (rare). Courtesy of Drs. John F. Anderson and Joseph Goldberger of the United States Public Health and Marine-Hospital Service.

Though my unfamiliarity with Mexican typhus hardly permits me to pass judgment, yet I am of the opinion that this is not a relapse in the proper sense of the term (v. section V. on definition of relapse, etc.). In typhoid fever, at any rate, this temperature curve would be interpreted as exhibiting a spurious relapse or pre-critical drop of temperature with a recrudescence.

IV. *Blood cultures; etiological and pathological considerations.*—In 2 of the 21 relapse cases on which this study is based, blood cultures during the relapse were positive whereas they had been negative during the original attack. In

the triple relapse case, which was originally admitted to the service of my colleague, Dr. Sydney Stein, there was a positive blood culture during the second relapse, which clinically was much more severe and of much longer duration than any of the other three attacks. Wood¹⁴ mentions 19 relapses in which the bacilli reappeared in the blood in 16. Cabot¹⁵ describes a case of multiple relapses in which the diagnosis was established during one of them by a positive blood culture and positive Widal reaction, the patient having been ill five months before admission to the hospital, and appendicitis, tuberculosis and typhoid having been considered as possibilities.

If we disregard the infrequent instances in which in typhoid fever a true second infection takes place, the question arises as to the modus operandi of the original infection in producing a relapse. Periodical exposure to the same source of infection before or during the development of the disease might account for the relapse. Regarding the etiology of relapses my revered teacher, Dr. Francis Delafield¹⁶ says: "The relapses of typhoid fever are a curious feature of the disease; they seem to be a fresh attack of the disease produced by a fresh infection within the patient himself." Another possible explanation is that one group of typhoid bacilli becomes localized under more favorable conditions than another, the former developing rapidly and causing the original attack, the latter multiplying more slowly and causing the relapse; or possibly one strain of organisms may not become neutralized by the antitoxin formed during the original attack, retaining their pathogenicity to produce the relapse. The well known persistence of typhoid bacilli in the gall bladder may possibly bear some causal relation to the relapse,—for instance, the passage of a considerable number of bacilli from the gall bladder into the intestine. It is conceivable also as hypothesized by Bena, that scabs and mucus from some of the healing ulcers wander elsewhere to infect new follicles; this hypothesis would apply particularly to those cases with long interpyrexial periods in which the patches originally involved are shown by autopsy to be higher than those affected just before and during the relapse. Before the days of blood cultures, the Widal reaction, and even the side-chain theory, Rosenblath¹⁷ conceived that because of relative inefficiency of the body reaction, though the contagium had become attenuated and a cure almost effected, yet a small residue of the poison retained its viability and caused a recurrence of the symptoms; in favor of this supposition were the observations which seemed to show that relapses were more frequent after tubbing, this therapeutic procedure having been assumed to retard the development and therefore the destruction of the contagium. Rosenblath had noticed previous to 1884 that in a large proportion of relapse cases the spleen remained enlarged during the intercalary period and he

quotes Biermer as having believed that some of the poison remained latent or that some of the lesions in the ileum developed more slowly than others. In this excellent monograph on relapses by Rosenblath, Gerhardt is quoted as having believed that the relapse is an autoinfection and that the supposed increased frequency of relapses since the advent of the Brand treatment was due to the swallowing of water in the tub. Be that as it may, it is not unwise during tubbing to prevent access of the tub water to the patient's mouth. Against the supposition that the patient is reinfected in the hospital is the fact that relapses are at least as frequent now as they were before strict precautions were exercised in hospital treatment.

Previous to twenty-five years ago relapses were falsely attributed by various authors to eating of solid food or unripe fruit, to getting out of bed too early, to the excitement of a visit, etc. Such unfavorable circumstances might cause recrudescences; but it is difficult to understand how they could produce relapses except in the sense that if the conditions predisposing to a relapse were already existent, the indiscretion might hasten its development.

V. *Definition; nomenclature in other languages; distinction between recrudescence, relapse and second attack; varieties of relapse.*—A relapse in typhoid fever may be defined as a characteristic repetition and regular evolution of some of the cardinal signs of the disease after complete defervescence and a distinct apyrexial period. By cardinal signs we mean prolonged temperature elevation, roseola, enlargement of the spleen, and (applying to those cases in which the Widal and blood culture have been negative during the original attack) a positive Widal reaction and positive blood culture. Some authors speak of relapses following afebrile periods of only one, two or three days, but in this study we have included only those relapses with interpyrexial periods of four days or more.

Slow in accepting the reality of relapses, René Proust¹⁸ and other French writers restrict the term "recidive" to a second typhoid infection occurring months or years after the patient has been cured of the original attack; they employ the appellation "rechute" for an attack which would be called *relapse* by American and English, and *recidive* by German authors. Proust criticizes Libermeister, Strümpell and Eichhorst for describing "rechutes" under the name "recidive."

The following tabular arrangement will serve to clarify the terminology in the three languages:

ENGLISH	GERMAN	FRENCH
Recrudescence	Nachschub or Nachfieber	Recrudescence
Relapse	Recidive or Wiederkehren	Rechute
Second infection	Zweiter Typhus	Recidive

A *recrudescence* or *nachschub* may be defined as a surelevation of temperature lasting several days and accompanied by a temporary recurrence or relative aggravation of typhoidal symptoms. Rosenblath defines the *nachschub* or *nachfiebers* as a prolongation or exacerbation of a typhoidal illness in which convalescence is not as yet well established. In criticism of this definition it may be said that there may or may not

were 40 relapses, or 8%. For thirty years previous to 1902, during which period reliable temperature observations were made, Fitz²¹ in his study of typhoid fever at the Massachusetts General Hospital found the average frequency of relapse to be 11.2%.

To show how the frequency of relapses varies under different conditions and at different times, I have compiled the following table:

Author	Place	Year	Epidemic or Endemic	No. of Typhoid Cases	No. of Relapse Cases	Percentage of Relapses
May	Munich	1882-1885	Endemic	209	29	13.8
Deumié	Paris	1881-1886	Endemic	227	19	8.3
Schill	Jena	1875	Epidemic	37	12	32.4
Knebel	Wiesbaden	1885	Epidemic	371	26	7
Stecher	Paris (barracks)	1885	Epidemic	193	6	3.2
Eichhorst	Zurich	1884	Epidemic	411	23	5.6
Bena	Strasburg	1872-1891	Endemic	598	72	12
Bena	Königsberg	1877-1887	Endemic	168	7	4.1
Osler	Baltimore	Previous to 1896	Endemic	500	40	8
Schlesinger	Vienna	1902-1907	Endemic	155	13	8.3
Koplik and Heiman	New York	1901-1906	Endemic (in children)	160	24	15
Ziegel	New York	1909-1912	Endemic (adults and children)	166	21	12.6

be an apyrexial period between the original attack and the recrudescence, and that recrudescences sometimes occur after complete defervescence.

Relapses may be *true*, *spurious* or *intercurrent*. The definition above given is that of a true relapse, and all of the 25 relapses included in our series are of this type. The spurious relapse may be either a recrudescence or the so-called post-typhoid sepsis. Intercurrent relapses undoubtedly do occur occasionally, but their recognition is a matter of individual judgment to such an extent that the cases which we regarded as intercurrent relapses in looking through the histories and charts of our 166 cases of typhoid fever, were not included in this study.

Again, relapses may be single, double, triple, etc. A further classification is into mild and severe types.

VI. *Frequency, number, age and sex.*—Our analysis of relapses is based upon a study of 166 cases of typhoid fever treated in the wards of Beth Israel Hospital from January 1, 1909, to March 1, 1912, a period of three years and two months. During this time there were 25 relapses in 21 of these 166 cases; that is, 12.6% of the cases had relapses. The frequency of relapses varies greatly in different times and places, and the percentage in our cases is somewhat higher than most authors have obtained in endemic typhoid. In 13,570 cases of typhoid fever collected by Bena¹⁰ and studied from 1853 to 1886 by various authors at Basel, Leipzig, Hamburg and Kiel there were 1,106 relapses, or 8.1%. In 500 typhoid cases studied by Osler²⁰ at Johns Hopkins Hospital previous to 1896 there

As to the *number of relapses*, 18 of our 21 cases were single relapses, 2 were double and 1 was triple. The relative frequency of double relapses in our series was 9.5%; compare this with 132 relapses cases studied by Bena with 13 double relapses, or 9.8%. Bena has observed one quadruple relapse and mentions a quadruple relapse studied by Deumié in which roseolæ were present during the fourth recurrence.

In our series there were 13 males and 8 females. The sexes are said to be about equally affected.

The average age of these 21 patients with 25 relapses was 20.4 years; the youngest was 6 years; the oldest 56 years (the only fatal case, complicated with intestinal hemorrhage and pneumonia). Four of the patients were younger than 13. Relapses are more common in children than in adults. Fleischl²² mentions 5 cases of relapse occurring in patients over 40 years of age; 2 of our patients were 44 and one was 56; I was unable to find in the literature a case of relapse in a person as old as this one, though Schultz has reported a case in a patient of 55.

VII. *Interpyrexial period; persistent enlargement of the spleen during; prognostication of relapses.*—The average interpyrexial period in our series was 7.92 days, the longest was 28 days (in the second relapse of the triple case), the shortest was 4 days (in 6 cases). After ten days of normal temperature relapses are infrequent (3 of our cases), and after two weeks of apyrexia relapses are rare (1 of our cases). Ebstein²³ in 1869 collected 22 cases of relapse and found the average intercalary period to be 12.3 days.

The time to look for a relapse is when the patient is entirely free from symptoms and convalescence is apparently well established. There is, however, no certain way of prognosticating a relapse.

A presumptive sign is the persistent tumefaction of the spleen after defervescence, to which many writers, including Ziemssen,²⁴ Curschmann²⁵ and A. Jacobi²⁶ have called attention. Jacobi says, for instance, that "the greatest care must be taken in those cases in which the spleen, when tumefied during the progress of the disease, does not nearly assume its normal size about the middle of the third week. When it remains large a relapse may be looked for." This sign was investigated in 13 of our cases. Of 12 single relapse cases, the spleen remained enlarged during the interpyrexial period in 8; in one of the double relapse cases, the tumefaction of the organ persisted in both afebrile intervals.

VIII. *General features and symptomatology.*—Since the relapse begins without prodromata and frequently the rise of temperature is the only sign of its onset, it is important to observe patients for at least two weeks after the termination of the original attack. Subjective symptoms are not present as a rule during the first few days of the relapse. The patient may be up and about with a good appetite, he may be gaining in weight, and not infrequently he is expecting to leave the hospital when the relapse begins. As Osler expresses it, "the temperature has become normal, the patient is happy and hungry, the relatives contented, the doctor congratulates himself that he has cured a case of typhoid fever, and then comes the relapse and the tempest of the soul, so to speak." A feeling of well being may continue throughout the relapse in spite of the fever and other signs. In exceptional cases with severe onset, however, symptoms may appear early with the initial rise of temperature—in such instances much earlier than in an original attack. Nervous and abdominal symptoms and circulatory disturbances such as are usually present in the second week of the original attack are rare during the relapse. During the early days of the relapse the appetite is usually not lost, and the patient often wonders why the diet is being restricted. As a rule, there is no diarrhoea, and pea-soup stools are rarely seen in relapses. Epistaxis, general pains, chilly sensations or chills, icterus and urinary signs of acute degeneration of the kidneys, have all been mentioned by different authors as occasional accompaniments of relapse, but not one of these symptoms or conditions was present in our cases.

As to the *temperature curve* in relapses, in our series the maximal temperatures reached 105° or higher in only 3 cases, 104° in 11 cases, 103° in 5 cases, and did not reach even 103° in the remaining 6 cases. The temperature during the first few days of the relapse

(1) May rise suddenly, as in 15 or 60% of our cases; or as in 18 of Bena's¹⁹ 62 relapses, or only 29%.

(2) It may rise gradually, as in 6 or 24% of our cases; or as in 15 of Bena's 62 cases, or 24%.

(3) It may be step-like, as in 4 or 16% of our cases; or as in 29 of Bena's relapses, or 47%.

The character of the curve at defervescence varies greatly; it seldom drops abruptly to normal, it may be intermittent or remittent, and usually falls by lysis, as in 18 of our 25 relapses.

Increased or renewed *enlargement of the spleen* is present in the great majority of relapses either before the onset or early in the course of the attack. The spleen was palpable in 22 out of our 25 relapses or in 88%, and in 90% of Bena's relapses. Bena quotes May as having found the spleen palpably enlarged in 27 out of 29 relapses.

Roseola was present in 17 or 81% of our relapses, our percentage being higher than that of German authors:

May in 29 relapses found new roseolæ in 16 cases or 55%.

Ziemssen in 112 relapses found new roseolæ in 87 cases or 77%.

Steinthal in 45 relapses found new roseolæ in 20 cases or 44%.

Bena in 63 relapses found new roseolæ in 37 cases or 59%.

Ebstein, however, observed a new roseola in 12 out of 13 relapses and quotes Baemler and Murchison as regarding a fresh eruption as rarely absent.

In relapses beginning acutely, roseola is absent less frequently than in those whose onset is gradual. Thus in our 25 relapses, of 15 with a sudden onset 12 exhibited roseolæ and 3 did not. Of 10 relapses in which the temperature rose gradually or was step-like at the onset, roseolæ were present in 5 cases and absent in 5. Schmidt's²⁷ observations in this regard are as follows: in 14 relapses with sudden onset (as regards the rise of temperature) roseola was present in every case; in 24 cases in which the temperature rose gradually, roseola was absent 10 times.

The *Widal reaction* was positive (1:50) in 12 of the 21 original attacks; and in 3 of the negative cases it became positive during the relapse.

Blood cultures.—Of the 15 original attacks in which blood cultures were made 6 were positive; and in 2 of the cases with negative blood cultures during the primary illness they were positive in the relapse.

Leukopenia.—In 12 of 22 relapses in which blood counts were regularly made there was a well marked leukopenia.

IX. *Duration of Relapses.*—The average duration in our 25 relapses was 14.28 days. The longest relapse was of 39 days' duration (the second relapse in the triple case). The shortest relapse was of 4 days' duration, with new

roseolæ, increased enlargement of the spleen and temperature elevation up to 104°. In 28 cases of relapse studied by Ebstein in 1869, the average duration was 13.8 days. Bena collected data which showed the average duration of 235 relapses to be 13 days. According to Delafield, "the relapse lasts from 7 to 39 days, the ordinary duration being from 10 to 14 days."

The temperature curve was the criterion employed in determining the duration of our relapses; when after a natural apyrexial period there occurred a rise of temperature above 100° together with other cardinal signs of typhoid fever, the relapse was regarded as having begun; when the temperature remained below 100° for a reasonable period, the relapse was considered as having terminated.

X. *Original attacks and relapses compared as regards severity, duration and the character of the temperature curve.*—Since the original attack gives the patient partial immunity, relapses are usually comparatively mild and of short duration. The average duration of the original attacks in 21 cases of typhoid fever in which there were 25 relapses was 22 days; compare this with the average duration of the relapse, viz., 14.28 days. The longest original attack was 45 days; the longest relapse 39 days. The shortest original attack was 14 days, the shortest relapse 4 days. In Ebstein's 28 cases, the average duration of the primary illness was 26.3 days as compared with an average duration of 13.8 days for the relapses. That the relapse is shorter than the original attack was observed by Stewart in 1840. In our series there were 3 exceptions to this rule: in the triple case the second relapse was the longest as well as the severest of the four attacks; in one of the double cases the second relapse was the longest of the three attacks; and in the other exceptional case the primary attack and relapse were each of 14 days' duration.

Employing the temperature curve as a guide in determining the severity of attacks, they have arbitrarily been called *mild* when the temperature remained below 103°; *moderately severe* when the maximal temperatures were between 103° and 105°, and *severe* when the highest temperature reached 105° or higher. Accordingly, we may tabulate the results in our series as follows:

	Original attacks	Relapses
Mild	6	6
Moderately severe	5	16
Severe	10	3
	—	—
	21	25

Of 63 relapses studied by Ziemssen, in 27 the maximal temperatures were lower than in the original attacks and in 19 higher.

There is great difference of opinion among German authors as to whether mild or severe attacks are more likely to have relapses. There

appears to be no constant relationship between the temperature curve in the original attack and that in the relapse.

Whereas during the acme of the original attack there is frequently a continuously high temperature (usually during the second week), in the relapses the temperature is usually remittent in type; the observation of Ziemssen²⁸ and Scholz²⁹ that the temperature curve in relapses is much more labile than in the original attack was confirmed by our clinical study.

XI. (1) *Brief report of our triple relapse.*
(2) *Abstract of Osler's celebrated double relapse case.*—(1) A married woman 21 years of age was admitted to the hospital on August 10, 1909, with the diagnosis of typhoid fever, which ran a mild three weeks' course. A few roseolæ were present, the spleen was not palpable, and the Widal reaction, a blood culture, and the Diazo test were all negative. On the 22d day of the disease the temperature reached the normal and remained below 100° for ten days. The spleen was not palpable during this first inter-pyrexial interval. A sudden rise of temperature to 102° marked the beginning of a mild relapse with maximal temperatures reaching 103°.

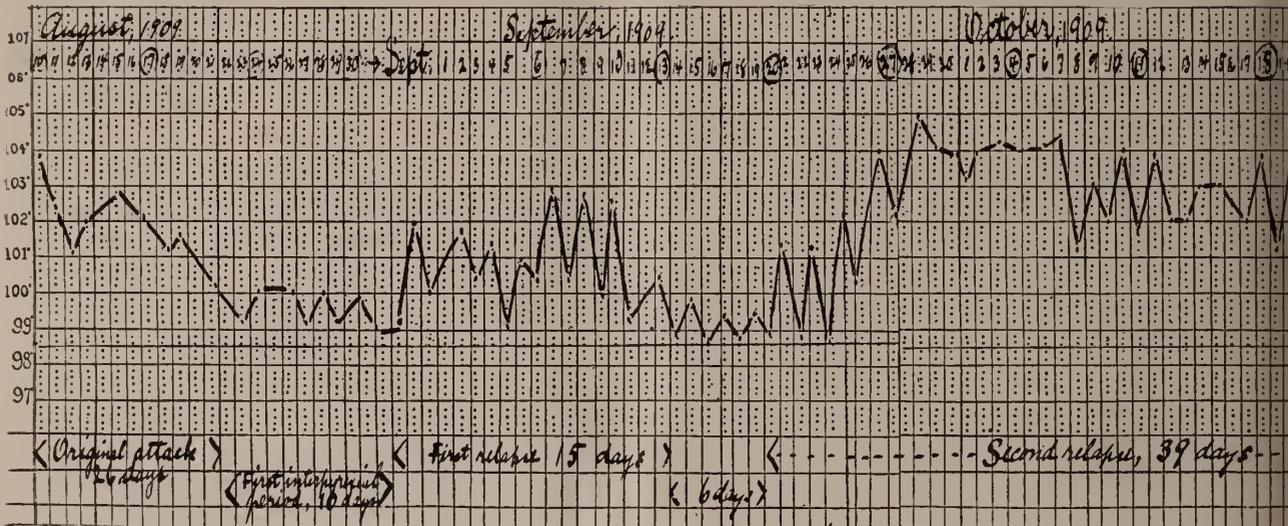
Numerous new roseolæ appeared, the spleen became palpable, the Widal and Diazo reactions were positive, but a blood culture was negative. The second period of apyrexia was of 6 days' duration with palpable spleen throughout. The second relapse, which was severe in type and of 39 days' duration, exhibited a step-like temperature curve during the first week, followed by a fastigium from 102° to 104° during the next three weeks. At the beginning of the fifth week of this relapse the temperature began to break, and after showing successively lesser evening rises and successively greater morning remissions for one week, again reached the normal and remained so for 28 days. Ten days after the onset of this second relapse the spleen was no longer palpable and never again became so. This attack was much severer than the original illness and the first relapse; stupor, severe headache, marked prostration, nausea and repeated vomiting, abdominal pain with moderate distension, signs of an acute diffuse bronchitis, and an apical systolic murmur which was not transmitted, were all present. At the beginning of the second week of this relapse, while the temperature was 104°, typhoid bacilli were for the first time recovered from the blood by Dr. J. J. Hertz. At defervescence recovery was rapid; yet the patient was kept under observation during four weeks of normal temperature, and after having been in the hospital about 16 weeks, was discharged on November 28, 1909, apparently cured. But on November 30th, having been home only two days, there was a chill which ushered in the third relapse and was followed by fever, headache and prostration. Four days later (December 3rd) the patient was readmitted

with a temperature of 105.4°; the fever continued high for another week and then in the course of three days reached the normal. The spleen was not palpably enlarged during this relapse and no new roseolæ appeared. After this protracted course of typhoid fever with three relapses, the patient was discharged cured on January 2, 1910, after having been in the hospital altogether over 5 months.

(2) Osler describes the case of a physician whose original illness was of 41 days' duration. After complete apyrexia for 23 days, when the patient was about to go home, fever developed and persisted for 41 days. This relapse was severe, the temperature reaching 104° and 105°.

adults. But relapses in typhoid fever in children are relatively more common than in adults.

XIII. *Diagnosis, mortality, complications; treatment; acknowledgment.*—Essential for the diagnosis of relapse are prolonged temperature elevation following a natural interpyrexial period and at least one additional cardinal sign of the disease, *i.e.*, roseola, enlarged spleen, or (in those cases with a negative Widal and negative blood culture during the original attack) a positive Widal or positive blood culture. To be differentiated from the relapse are the recrudescence (*v. definition* under V), the so-called post-typhoid sepsis, typhoid pyelitis, central or atypical pneumonia developing during convalescence,



TEMPERATURE CURVE SHOWING THREE

There followed a period of complete apyrexia for 42 days. Then there was moderately high fever for 14 days with furred tongue and abdominal distension, but no new roseolæ. Altogether the original attack and the two relapses covered a period of 6 months.

XII. *Relapses in children.*—In 1906 I aided Doctors Koplik and Heiman³⁰ in the preparation of a paper based upon 24 relapses occurring in 160 cases of typhoid fever treated from 1901 to 1906 in the children's service at Mount Sinai Hospital. The children were from two and one-half to fourteen years of age; the average age was nine years. The proportion of relapses to the whole number of cases of typhoid was 15 per cent. There were 11 single, 4 double relapses, and 1 triple relapse. The average interpyrexial interval was 8 days (7.9 days in our series in both adults and children). The average duration was 13 days (as compared with 14.28 days in our series). The average duration of the primary attacks was 24 days (22 days in our series).

In general it may be said that the individual relapses in children are very similar to those in

etc. It has already been stated that the case whose fever curve Dr. Joseph Goldberger kindly sent us as illustrating a rare condition in typhus, *viz.*, relapse, is regarded by us as one of recrudescence rather than of relapse. In the only fatal case of our series the diagnosis was difficult; the patient, 56 years of age, had been treated for three weeks outside of the hospital for a febrile affection which could not be diagnosed; the Widal had been negative; several days after admission the development of fever and a positive Widal reaction cleared up the diagnosis; there were no roseolæ and the spleen was not enlarged; during the relapse there was a severe intestinal hemorrhage from which the patient recovered, but then a pneumonia supervened and death. I am indebted to Dr. Nettie P. Shapiro for the details of this case previous to admission.

The *mortality* in relapse cases without complications is practically nil. Bena compared the mortality in a large number of relapses with that in the same number of typhoid fever cases without relapses:

Mortality

1294 cases of typhoid fever with relapses 5.9%

1294 cases of typhoid fever without relapses 13 %

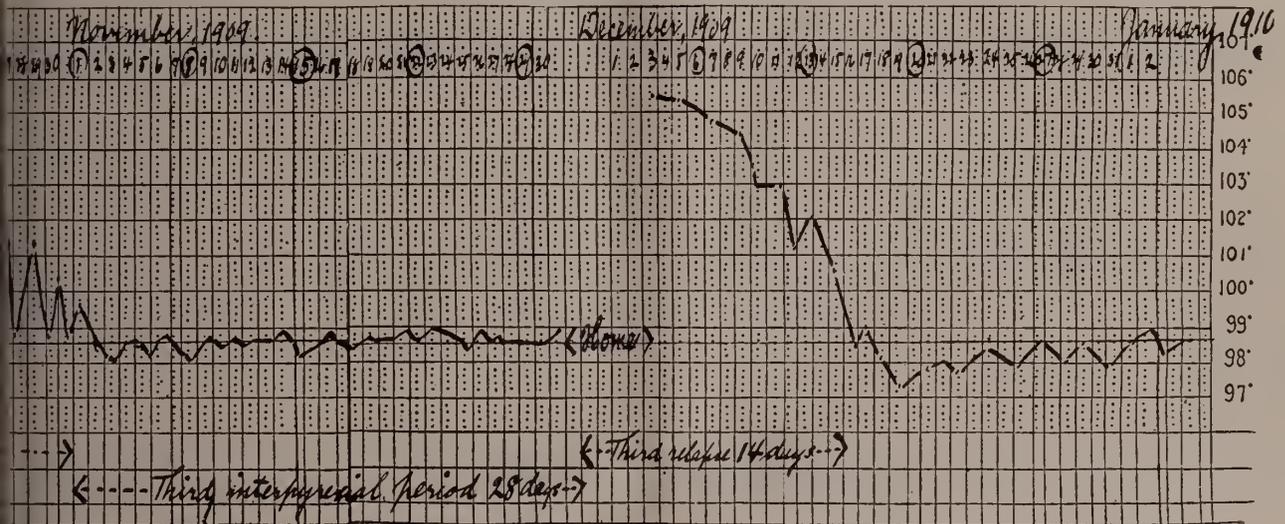
Bena concludes that the mortality in relapses is less than half of that in ordinary cases, a conclusion which can be drawn also from our cases, as shown by the following:

	Deaths	Mortality
21 relapse cases with	1	4.7%
145 cases without relapses with	21	14.5%
166 (total number of typhoid cases)	22	13.2%

SUMMARY AND CONCLUSIONS.

A relapse in typhoid fever may be defined as a characteristic repetition and regular evolution of some of the cardinal signs of the disease after complete defervescence and a distinct apyrexial period. By cardinal signs we mean prolonged temperature elevation, roseola, enlargement of the spleen, and (applying to those cases in which the Widal and blood culture have been negative during the original attack) a positive Widal and positive blood culture.

A recrudescence in typhoid fever may be defined as a surelevation of temperature lasting several days and accompanied by a temporary recurrence or relative aggravation of typhoidal



RELAPSES IN A CASE OF TYPHOID FEVER.

Death during a relapse is rarely due to toxemia, generally to a complication.

Serious complications in relapses are comparatively rare, the most frequent being pneumonia and intestinal hemorrhage, both of which were present in our fatal case. Other complications were bronchitis (in two cases); and bilateral femoral phlebitis, suppurative parotitis, and tibial neuritis, each in one case.

The ordinary expectant method of treatment was employed in these 166 cases of typhoid fever. While the administration of vaccines during the acute stage of the original illness is often harmful and is not advised, it would be interesting to note the effect with regard to relapses of employing vaccine therapy during convalescence.

Finally, my thanks are due to the following attending physicians and adjuncts at Beth Israel Hospital: Dr. Jonas E. Reinthaler, Dr. David Robinson, Dr. Adolph A. Himowich, Dr. Alfred F. Hess, Dr. Sydney Stein, Dr. Joseph Barsky and Dr. David Sheitlis, all of whom kindly permitted me to include in this study relapse cases which occurred on their services.

symptoms; the recrudescence may occur either before or after defervescence.

The relapse has been a factor in the differentiation of sporadic typhus from endemic typhoid fever as these diseases now appear in New York City, as well as in the original differentiation of typhoid fever from typhus seventy-five years ago.

That the relapse is a true septicemia as well as a bacteriotoxemia is proven by the recovery from the blood of typhoid bacilli during the attack.

Regarding the etiology of the relapse, though several hypotheses appear plausible enough, yet really unknown are the underlying causes of the repetition or renewal of the characteristic lymphoid changes in the small intestine which constitute the pathological basis of the relapse.

When the Brand treatment is employed it is not unwise to prevent access of the tub water to the patient's mouth.

Relapses are at least as frequent nowadays as they were before strict precautions were observed in the hospital management of typhoid fever. In 166 cases of typhoid fever treated dur-

ing three years by the ordinary expectant method, 12.6 per cent. of the cases had relapses.

After ten days of normal temperature relapses are infrequent and after two weeks they are rare. Nevertheless, because of the occasional occurrence of relapses after interpyrexial periods of four weeks (one of our cases) or even of six weeks (one of Osler's cases), after defervescence the patient should be observed for at least two weeks in the hospital and should be seen occasionally at home for at least a month after discharge.

Though there is no certain way of prognosticating a relapse, a presumptive sign is the persistent tumefaction of the spleen after deferves-

cence; this sign was present in 78 per cent. of the cases in which it was investigated.

The relapse has nothing characteristic in its general features or its symptoms to distinguish it from the original attack; the relapse, however, usually begins without anorexia and without other prodromata,—the rise in temperature often being the first sign; moreover, relapses are usually comparatively mild and of short duration, and the temperature curve is more labile than in the original attack.

Relapses are relatively more common in children than in adults.

Since complications are infrequent in relapses and since the mortality in relapses without com-

RELAPSES IN TYPHOID.

No. of relapses	Year	Sex	Age	Duration of primary attack	Character of primary attack	Widal	Blood culture	Interpyrexial period	Character of onset of relapse	Temperature curve, character of	Temperature, height of	Duration of relapse	
1	1909-10	F	21 yrs.	26 days.	Mild.	Positive in relapses.	Positive in 2nd relapse.	10 days.	Sudden.	Irregular.	Below 103	15 days	
2								Triple relapse	6 days.	Step-like.	Continuously high.	Up to 104 & 105	39 days
3								24 days.	Moderate.	Negative.	Negative.	7 days.	Gradual.	Irregular.	To 104 & 105	6 days
4	1909-10	M	12 yrs.	45 days.	Severe.	Positive.	Positive.	14 days.	Step-like.	Continuously high.	Up to 102-103	8 days	
5	1909-10	M	44 yrs.	21 days.	Severe.	Positive.		5 days.	Sudden.	High, remit. last week.	101-103.6	16 days	
6	1909-10	F	21 yrs.	24 days.	Moderate.	Negative.	Negative.	10 days.	Sudden.	Intermittent.	100-102.8	14 days	
7								28 days.	Severe.	Positive.	Pos. in rel'se. Neg. in attack.	7 days.	Sudden.	Intermittent.	To 104	4 days
8	1909-10	M	15 yrs.	21 days.	Severe.	Positive.	Positive.	5 days.	Sudden.	Continuously high.	Up to 104	16 days	
9	1909-10	M	17 yrs.	28 days.	Severe.	Negative.	Negative.	10 days.	Gradual.	Intermittent.	To 102	14 days	
10	1909-10	F	6 yrs.	18 days.	Mild.	Positive.		8 days.	Step-like.	Cont. high first week, remittent thereafter.	To 104	17 days	
11	1909-10	M	28 yrs.	35 days.	Severe.	Negative.	Positive.	4 days.	Gradual.	Cont. high first week, remittent, 2nd and 3rd.	To 104	21 days	
12	1909-10	F	14 yrs.	31 days.	Moderate.	Positive.	Negative.	4 days.	Sudden.	Intermittent.	To 102.8	9 days	
13	1909-10	M	15 yrs.	21 days.	Moderate.	Negative.		7 days.	Sudden.	1st week cont. high, 2nd week intermittent.	To 104	14 days	
14	1909-10	M	44 yrs.	14 days.	Mild.	Positive.		4 days.	Sudden.	1st week high, 2nd week remittent..	Up to 103	14 days	
15	1910-11	M	10½ yrs.	22 days.	Severe.	Positive.	Positive.	12 days.	Sudden.	Remittent.	To 105	7 days	
16	1910-11	M	15 yrs.	31 days.				4 days.	Sudden.	Remittent.	Up to 102.6	19 days	
17	1910-11	F	17 yrs.	18 days.	Mild.	Positive.	Negative.	10 days.	Sudden.	Continuously high.	To 104	7 days	
18								Double relapse	5 days.	Sudden.	Remittent.	Up to 103.4	23 days
19	1911-12	F	56 yrs.	21 days.	Moderate.	Positive.		4 days.	Sudden.	Irregular.	To 104	14 days	
20	1911-12	F	13 yrs.	31 days.	Moderate.	Negative.	Negative.	5 days.	Gradual.	Continuously high.	To 104	23 days	
21	1911-12	M	17 yrs.	42 days.	Severe.	Positive.	Negative.	7 days.	Sudden.	Intermittent.	Below 103	7 days	
22	1911-12	M	6½ yrs.	15 days.	Mild.	Negative.	Negative.	9 days.	Gradual.	Remittent.	To 104.2	12 days	
23	1911-12	F	18 yrs.	20 days.	Moderate.	Negative.		4 days.	Gradual.	Remittent.	To 104	14 days	
24	1912	M	19 yrs.	38 days.	Severe.	Negative.	Positive.	9 days.	Step-like.	Remittent.	To 104	10 days	

M 13	F 8	25	550	Mild, 6 (below 103 deg. F.)	25	198	25	357
Average, 20.4 years		Average, 22		Mod., 5 (103 deg. to 105 deg.)	Average, 7.92 days	Sudden, 15	Mild, 6	14.28 days, average
Oldest, 56 years		Longest, 45		Severe, 10 (up to 105 deg. or higher)	Longest, 28 days	Gradual, 6	Moderate, 16	39 days, longest
Youngest, 6 years		Shortest, 14		21 original attacks	Shortest, 4 days	Step-like, 4	Severe, 3	4 days, shortest
9 of 21 cases under 16 years of age.					(6 cases)	25		

plications is practically nil, the physician should assuage needless alarm on the part of relatives and friends over the occurrence of a relapse.

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RELAPSES IN TYPHOID.

Spleen during inter-pyrexial interval	Spleen during relapse	Roseola during relapse	Mental symptoms	Abdominal symptoms	Leukocytes during relapse	Leukocytes during original attack	Complications	Result	Remarks
Not palpable.	Palpable.	Yes.	None.	None.	6,600-8,000	6,000		Cured.	Total duration 138 da.
Palpable.	Not palpable.	Yes.	Yes.	Yes.	6,600-9,000		Bronchitis.			Stupor, nausea, vomiting, severe headache, prostrations, abdominal pains and distension; bronchitis, systolic murmur
Not palpable.	Not palpable.	Yes.	None.	None.	7,200-8,000			Cured.	Patient in hospital nearly six months.
Not palpable.	Palpable.	No.	None.	None.	10,000-12,000	8,000-12,000	None.	Cured.	
Palpable.	Palpable.	Yes.	None.	None.	2,800-5,500	7,600-8,800	None.	Cured.	
Not palpable.	Palpable.	Yes.	Apathy, dulness.	None.		9,000-9,400		Cured.	Roseolæ very numerous
Palpable.	Palpable.	Yes.	Apathy, dulness.	Vom., abd. pain, distension.	6,600	7,600	Bronchitis.		
Palpable.	Palpable.	Yes.	None.	None.	8,600-9,600	8,400-11,000	Bilateral Femoral Phlebitis.	Cured.	
Not palpable.	Not palpable.	Yes.	None.	None.	8,600-9,200	9,200-9,600	None.	Cured.	
Palpable.	Palpable.	No.	None.	None.	7,200-13,000	7,800-9,800	None.	Cured.	
Palpable.	Palpable.	Yes.	None.	None.	6,800-8,400		None.	Cured.	
Palpable.	Palpable.	Yes.	Restlessness.	Vomit. and distension.		4,200	Suppurative Parotitis.	Cured.	
Not palpable.	Palpable.	Yes.	None.	None.	8,600	8,000	None.	Cured.	
Palpable.	Palpable.	Yes.	None.	None.	6,000	6,000	None.	Cured.	
Palpable. 3 f.	Palpable.	Yes.	None.	None.	2,800-8,500	7,600-8,800	None.	Cured.	
Palpable.	Palpable.		None.	None.	8,000-10,000	7,000-8,800	None.	Cured.	
Palpable.	Palpable.		None.	None.	5,800		Tibial Neuritis.	Cured.	
	Palpable.		None.	None.		5,200			
Palpable.	Not palpable.	No.	None.	Tenderness, Tympanites	9,000	7,000	Pneumonia after Intest. Hem.	Cured.	Cause of death—pneumonia Dr. Shapiro's case
	Palpable.	No.	None.	Gall bladder tenderness.	9,200	5,500	None.	Cured.	
Palpable.	Palpable.	Yes.	None.	None.	9,000	6,000	None.	Cured.	
	Palpable.	Yes.	None.	None.	8,200	8,200	None.	Cured.	
Palpable.	*Palpable.	No.	None.	None.	7,500	7,800	None.	Cured.	
Palpable.			None.	None.		8,200	None.	Cured.	

Relapse Cases:	No. of relapses	} Total number of typhoid fever cases in which these relapses occurred, = 166. Percentage of relapse cases, = 12.6
Single, 18	18	
Double, 2	4	
Triple, 1	3	
	21	25

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THE TREATMENT OF ARTERIO-SCLEROSIS BY PHYSIOLOGICAL METHODS.*

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BY arteriosclerosis I understand a progressive degeneration of the vascular system, characterized pathologically by thickening of the blood vessel walls, and clinically by increase of the blood pressure. The change in the walls of the arteries of all sizes varies from simple fatty degeneration of the intima (atheroma), through increased thickness in varying degree of the media and adventitia, to the deposition of lime salts.

The disease is chronic and progressive and invariably ends fatally. The symptoms may manifest themselves in the brain, the heart, the kidneys, the skin, or in any other organ depending upon the region in which the degenerative process is progressing with the greatest rapidity. They are vague, irregular and often the combination of complaints is such that the patient is forthwith written down a neurasthenic. Doctor Sutter and I¹ found upon analysing the records of fifty-one cases of neurasthenia that ten gave evidence of arteriosclerosis with high blood pressure, 19.6 per cent. In addition, in this series of cases there were four which gave evidence of beginning interstitial nephritis, and, one which showed myocarditis and arteriosclerosis. If we include these, there were fifteen cases of neurasthenia associated with arteriosclerosis or 29.4 per cent.

The treatment of the condition by drugs is notoriously unsatisfactory, and it has been found that other methods give more relief than can be obtained by medicine. Perhaps the best results are produced by a judicious combination of physiological methods and drugs. Of the latter this paper can take no account. The physiological methods that have been recommended in the treatment of this disease are (1) rest combined with massage; (2) diet; (3) hydrotherapy, the hot full bath, the tepid or neutral full bath, and carbonated brine (Nauheim) baths; (4) thermotherapy; the electric light bath, the vapor cabinet bath, and the Russian bath; (5) electricity, galvanism, faradism, high frequency electricity (autocondensation and ultra violet rays) and the crown breeze.

These measures have merely a symptomatic effect and in no way serve to cure the disease. In some instances it has appeared that the relief of the symptoms was accompanied by a less rapid advance of the change in the blood vessels; but of this one cannot be sure.

In the employment of rest and massage the best results are obtained when the patient is put to bed for a period of two or three weeks. The

* Read at the annual meeting of the Medical Society of the State of New York, held in Albany, April 16, 1912.

rest should be nearly absolute although there can be no objection to the patient going to the bath room, nor to his reading. It is better for him not to see visitors, however. He should have forty minutes general massage daily by a competent operator. The patient may take his customary sanitary bath.

In the case of a male, aged 68 years, the blood pressure on the first examination was as follows: Systolic, 166; diastolic, 88; mean, 127; pulse pressure, 78. Pulse 86, regular, good strength and volume; artery palpable. Brachial artery palpable, temporal artery visible and tortuous, but not palpable.

The patient was then put to bed for two weeks and given forty minutes general massage daily. At the end of the first week the blood pressure was as follows (Tycos instrument): Systolic, 144; diastolic, 74; mean, 109; pulse pressure, 70; pulse, 72; regular, good strength and volume; artery palpable.

At the end of the second week in bed with 40 minutes' massage daily the blood pressure determination gave the following result (Tycos instrument): Systolic, 140; diastolic, 80; mean, 110; pulse pressure, 60; pulse, 72; regular, good strength and volume.

In this case then, two weeks' rest in bed with general massage was accompanied by a reduction of 26 mm. in the systolic pressure; and a reduction of 8 mm. in the diastolic pressure; a reduction of 17 mm. in the mean pressure; and a reduction of 18 mm. in the pulse pressure. At the same time the frequency of the pulse was reduced from 86 to 72. At the end of the second week the patient was allowed to get up. He was then given a bath at 98° F. containing 1.2 per cent. sodium chloride and 0.41 per cent. calcium chloride, alternating with general massage.

At the end of the first week the blood pressure observations were as follows: Systolic, 165; diastolic, 95; mean, 130; pulse pressure, 70.

At the end of the second week: Systolic, 162; diastolic, 88; mean, 125; pulse pressure, 74.

At the end of the third week: Systolic, 164; diastolic, 86; mean, 125; pulse pressure, 78.

At the end of the fourth week: Systolic, 159; diastolic, 90; mean, 124.5; pulse pressure, 69.

At the end of the fifth week: Systolic, 152; diastolic, 78; mean, 115; pulse pressure, 74.

At the end of the sixth week: Systolic, 167; diastolic, 88; mean, 127.5; pulse pressure, 79.

At the end of the seventh week: Systolic, 157; diastolic, 90; mean, 123.5; pulse pressure, 67.

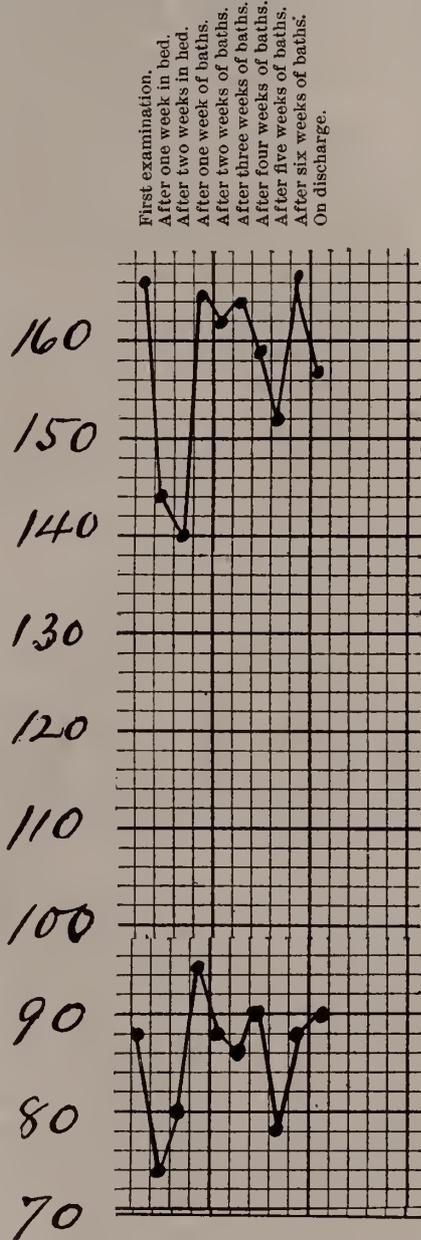
It is to be observed that in this case as soon as the patient was allowed to get up and go about, the systolic pressure returned to its original height where it remained, in spite of treatment which is supposed to have some influence in reducing blood pressure. (Chart I.)

The diet of these patients should be a mixed diet of easily digestible foods, with a fair amount of residue, and moderate in amount. Proteid

CHART I.

THE INFLUENCE OF REST IN BED AND GENERAL MASSAGE ON THE BLOOD PRESSURE.

(Top Lines Systolic; Bottom Lines Diastolic.)



food should especially be restricted. The patients are better off without tea or coffee, and no alcohol should be allowed under any circumstances. Tobacco should be restricted, or absolutely prohibited. The principal meal is best taken in the middle of the day and should be followed by a period of rest.

Breakfast should consist of fresh fruit, one egg, either soft boiled, poached, or scrambled; buttered toast, and milk, which may be warm or cold, depending upon the wishes of the patient, or buttermilk.

In the middle of the morning the patient may have a glass of milk, or of buttermilk.

Dinner should be served at midday and should consist of cream soup, a small piece, not more than 50 grams, of roast beef, roast lamb, roast or boiled mutton, roast or stewed chicken or very fresh fish, one baked potato and one other vegetable, a small helping of salad, and a simple dessert.

In the middle of the afternoon the patient may have a glass of milk, or of buttermilk.

The evening meal should be light and should consist of broth, bread and butter, buttered toast, or milk toast, milk or buttermilk, custard, junket, cornstarch, rice pudding, tapioca pudding, or fresh or stewed fruit.

The reduction in the amount of proteid is necessary to prevent the formation of toxic material by the putrefaction of the proteid in the intestine, with subsequent absorption and deleterious consequences. It is probable, also, that the excess of nitrogenous substances in the blood and lymph dependent upon a diet with a high protein content may have a directly harmful local influence on the blood vessels.

The effect of the hot full bath and the tepid or neutral full bath are to reduce blood pressure temporarily. In addition to this the hot full bath promotes the elimination of toxic material and nitrogenous substances by the skin.

The hot full bath is given at from 106° to 112°, depending upon the sensibility of the patient. The tub is filled with the water, the requisite temperature is determined by the use of a thermometer, and the patient is assisted into the tub in which he lies quietly at full length until perspiration appears on his forehead, usually ten minutes. The bath may be started at 106° and gradually raised in temperature by the addition of more hot water, always determining the temperature of the bath with the thermometer. In obese individuals with fat hearts, in addition to the arteriosclerosis, this bath may be followed by a blanket pack for one-half, three-quarters, or a full hour. The bath or the bath and the blanket pack is to be followed by a spray at 98° and gradually lowered to 80°, 75°, or 70° depending upon the reaction in the individual case. The spray should never be started cold in the case of arteriosclerosis, nor should an arteriosclerotic be allowed to go from a hot treatment into a cold plunge. The spray should not be reduced below 98° if it causes any unpleasant sensations. This bath may be given with salt water, or any natural brine, the analysis of which is known, can be imitated in the patient's own bath tub.

For thin patients such a treatment is too severe and should be replaced by the neutral full bath. In this bath the temperature of the water is 98°, never above 100°. The patient lies in the water for ten minutes, is then given a spray at 98°, if a spraying apparatus is convenient,

dried and allowed to rest for one hour or more. This bath may be given with plain water or with salt water.

CHART II.

INFLUENCE OF RUSSIAN BATH ON SYSTOLIC BLOOD PRESSURE.

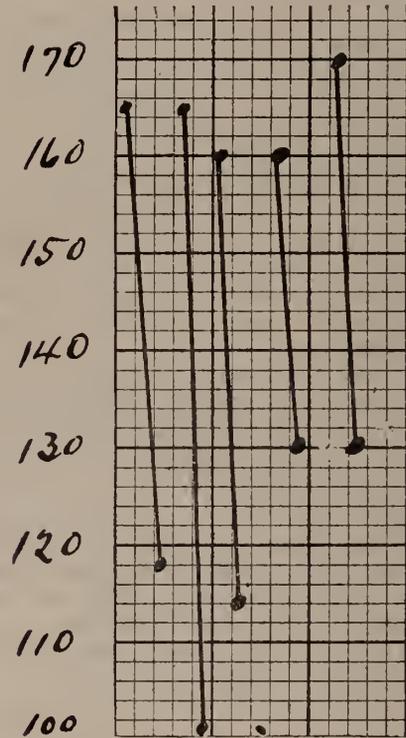
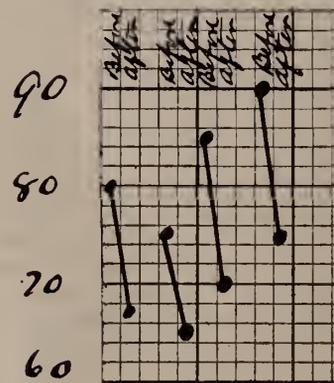


CHART III.

INFLUENCE OF RUSSIAN BATH ON DIASTOLIC PRESSURE.



To give a salt bath the dimensions of the tub are taken, preferably in the metric system, its cubic contents calculated, and a 1.5 per cent. or 2 per cent. solution of sodium chloride or sea salt made.

For example: In a bath tub which measures 130 cm. by 61 cm. by 26cm. the cubic contents is a little over 206 liters. In order to make a 2 per cent. solution of sodium chloride, 4 kilograms of

salt would be needed, or about 9 pounds. If it were desired to add calcium chloride to such a bath the amount required to make a 0.2 per cent solution would be 400 grams or about twelve ounces.

For robust patients the blood pressure may be reduced and elimination promoted by the vapor cabinet bath. This bath may be used on alternate days with the hot full bath either of fresh or of salt water.

In a paper read before this society last year² and in two other communications published during 1911,^{3 4} I have given the opinion that Nauheim baths ought not to be given in cases of advanced arteriosclerosis. I have also stated that in the earlier cases of arteriosclerosis accompanied by fibroid myocarditis and high blood pressure cold baths should not be given and that carbon dioxide should not be added to the baths. I have seen no reason to change this opinion. In fact I am quite sure that in cases of arteriosclerosis, as a rule, Nauheim baths are harmful, I mean by a Nauheim bath a salt bath containing carbon dioxide at a temperature of between 85° and 95°.

In the case of a male, who, upon first examination, had a systolic blood pressure of 262 mm., an observation made before the administration of a carbonated brine bath gave the following result: Systolic, 228; diastolic, 170; mean, 199; pulse pressure, 58.

Immediately after the bath the blood pressure was, systolic, 258; diastolic, 194; mean, 226; pulse pressure, 64.

In the case of another male patient who had a systolic pressure varying between 206 and 224, an observation made on the day on which a carbonated brine bath was administered by the earnest solicitation of his attending physician, showed the blood pressure to be, systolic, 224; diastolic, 156; mean, 190; pulse pressure, 68.

Two days after the administration of this bath the patient had a severe uremic convulsion. It seems to me that a form of treatment that is apparently capable of raising the systolic pressure 30 mm., the diastolic pressure 24 mm., the mean pressure 27 mm., and the pulse pressure 6 mm., is not a method that is safe to employ in a patient with arterial degeneration.

It is of course impossible to say that the carbonated brine bath in the second case was responsible for the uremic attack, but it would be unwise to use this form of treatment in any patient in whom there was a possibility of the occurrence of such a condition.

In cases complicated by asthmatic attacks or by subacute or chronic bronchitis the Russian bath is of value. In this form of bath the patient reclines at ease in a steamer chair in a room filled with steam so that he breathes an atmosphere saturated with moisture. After the bath the patient receives a tepid spray, is rubbed down and rests for an hour. It is possible by suitable

apparatus to impregnate the steam in the Russian room with a solution of salt of varying composition.

In the case of a male patient, aged 65 years, who had an aneurism of the descending portion of the arch of the aorta, which was accompanied by severe and frequent asthmatic attacks, the Russian bath produced the following effects on the blood pressure.

The observations were made by Dr. George Palmer Thomas:

	Systolic.	Diastolic.	Mean.	Pulse Pressure.
Before	165	80	125.5	85
After	118	76	92.5	45
Before	165	75	120	90
After	100	65	82.5	35
Before	160	85	122.5	75
After	130	70	100	60
Before	170	90	130	80
After	130	75	102.5	55

Pulse rate:

Before.	After:
106	100
106	94
120	110
100	90
116	110

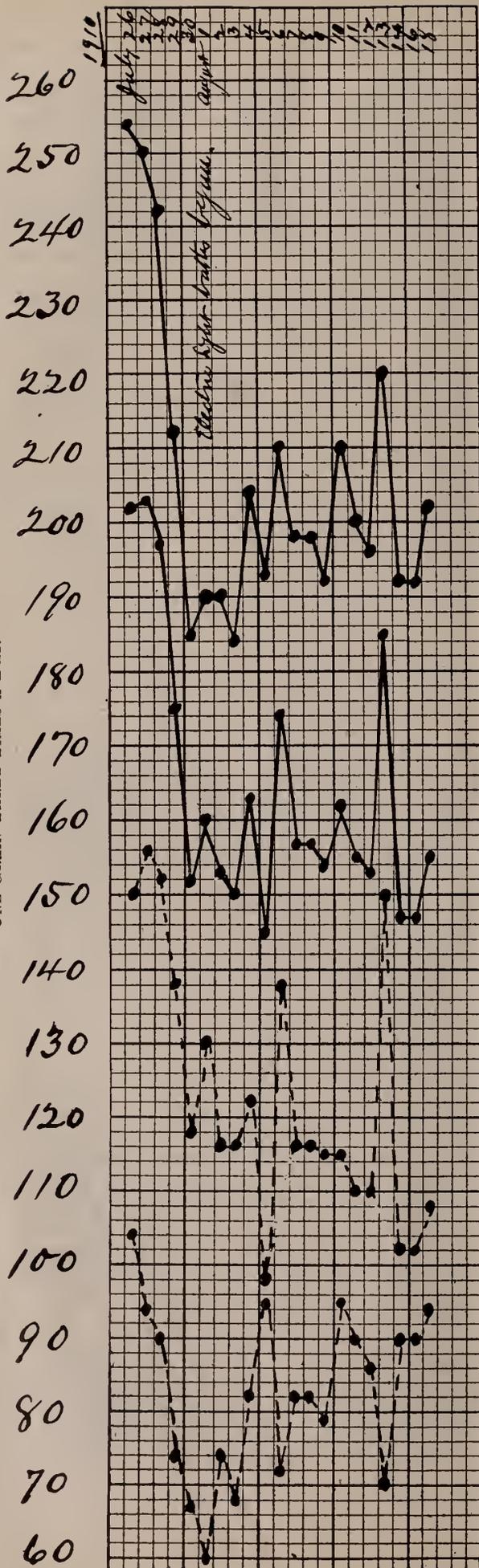
It will be seen that this form of treatment produced a marked depression of the systolic pressure (Chart 2); a less marked depression of the diastolic pressure (Chart 3), and a lowering of both the mean pressure and the pulse pressure in this patient.

It also served to slow the pulse. I have frequently found, however, that immediately after a Russian bath the pulse is accelerated, the lower rate appearing soon after the patient assumes the recumbent posture. This slowing in the rate of the pulse may be accounted for by rest and change of position only.

The electric-light bath is of great value in cases of arteriosclerosis. It can be administered to the robust patient and to the thin patient. In the former its effect can be continued for from one-half to one hour by putting the patient in a blanket pack. In the latter the spray should be given at the end of the ten minutes spent by the patient in the cabinet. In both the spray should be followed by an hour's rest in bed. The patient should not read, if he is at home, or converse with his neighbor in the rest room of a sanatorium or bathing establishment.

In the case of aneurysm of the descending portion of the arch of the aorta, already referred to, electric light baths were used alternately with Russian baths. On two occasions observation of the blood pressure were made before and after the bath by Dr. Thomas.

CHART IV.
BLOOD PRESSURE CURVES. CASE OF ADVANCED ARTERIOSCLEROSIS AND CHRONIC NEPHRITIS UNDER TREATMENT WITH ELECTRIC LIGHT BATH DAILY AND SODIUM NITRITE ONE GRAIN THREE TIMES A DAY.



Systolic Pressure.

Mean Pressure.

Diastolic Pressure.

Pulse Pressure.

	Systolic.	Diastolic	Mean.	Pulse Pressure.
Before	150	85	117.5	65
After	115	70	92.5	45
Before	170	100	135	70
After	150	95	122.5	55

It will be seen that the systolic pressure was reduced 35 millimeters after one bath and 20 millimeters after the other. The diastolic pressure was reduced 15 millimeters and 5 millimeters, respectively; the mean pressure was reduced 12.5 millimeters; and the pulse pressure was reduced 20 millimeters and 15 millimeters. The pulse rate was hardly affected. The symptomatic relief was noteworthy, but temporary only.

On the other hand in the case of a male, aged about 60 years, who presented a well advanced arteriosclerosis, with chronic nephritis, a serious attack of uremia occurred on July 25, 1910. This attack was characterized by severe convulsive seizures, and was relieved after a good sized venesection. This patient received one grain of sodium nitrite three times a day from July 26th until August 22d. On August first the patient received an electric light bath daily in addition to the sodium nitrite. Dr. Harold DeWolf made daily observations of the blood pressure of this patient with the following results (Chart 4):

Date.	Systolic.	Diastolic.	Mean.	Pulse Pressure.
1910. July 26.	254	150	202	104
27.	250	156	203	94
28.	242	152	197	90
29.	212	138	175	74
30.	185	118	151.5	67
Aug. 1.	190	130	160	60
2.	190	116	153	74
3.	184	116	150	68
4.	204	122	163	82
5.	193	98	145.5	95
6.	210	138	174	72
7.	198	116	157	82
8.	198	116	157	82
9.	194	115	154.5	79
10.	210	115	162.5	95
11.	200	110	155	90
12.	196	110	153	86
13.	220	150	185	70
14.	192	102	147	90
16.	192	102	147	90
18.	202	108	155	94

It will be observed that of the methods recommended so far in the symptomatic treatment of arteriosclerosis and its most prominent physical accompaniment, high blood pressure, all except the tepid full bath, produce sweating and that after each treatment a period of rest is advised of at least one hour's duration. In my opinion, the sweating and the rest accomplish the good results in these cases. There is no mysterious in-

fluence of water, of components of brine, of actinic rays, or any other occult influence at work.

Miller⁵ says: "It has been my experience that post-sternal oppression, so-called uremia dyspnea, and mild pulmonary edema are relieved more uniformly by sweats than by any other measure." He also says: "A single sweat reduces hypertension less than a moderate dose of vasodilators. If sweats are given daily, a rather marked reduction of pressure, lasting through the day is not infrequently observed. When the sweats are discontinued the blood pressure soon returns to its previous level."

Among the electric methods it has long been known that galvanism and faradism are of value in the treatment of the paresthesias and hyperesthesias accompanying arterial thickening.

The electric treatment which is attracting considerable attention at the present time is the autocondensation method of applying a high frequency current. The method of application is thus described by Tousey⁶:

"Wires from two different turns of a small solenoid uniting the two outer armatures pass, one to an electrode held by the patient and the other to a large sheet of metal upon which the patient lies, but from which he is separated by an insulation mattress."

The patient reclines in a chair furnished with a cushion beneath which a pad of wire gauze is

connected with a high frequency machine. In each hand he holds a hand grip which is also connected with the high frequency machine. The machine is started and the current generated is supposed to be stored up in the patient's body. The patient receives the current for from ten minutes to one-half hour.

In the case of a male, aged between 55 and 60 years, when given upon the advice of the physician who referred the patient, the treatments were one-half hour in duration. The patient had been having a systolic pressure uniformly above 200; during one of the treatments he had an attack of acute dilation of the heart and his pulse immediately increased to 170 per minute. This circumstance led me to conclude that this form of treatment was dangerous in cases of arteriosclerosis with high blood pressure. But after having carefully studied the blood pressure observations made by Dr. Harold De Wolf, before and after autocondensation treatments in the case of a male patient aged about 60 years with well advanced arteriosclerosis and chronic nephritis (Charts 5, 6, 7 and 8), I am convinced that I must alter that conclusion. The patient is the same as the one in whom blood pressure observations have been recorded in connection with the administration of sodium nitrite and electric light baths. The autocondensation treatments were begun when the patient was first seen.

CHART V.
SYSTOLIC PRESSURE BEFORE AND AFTER AUTOCONDENSATION TREATMENT.

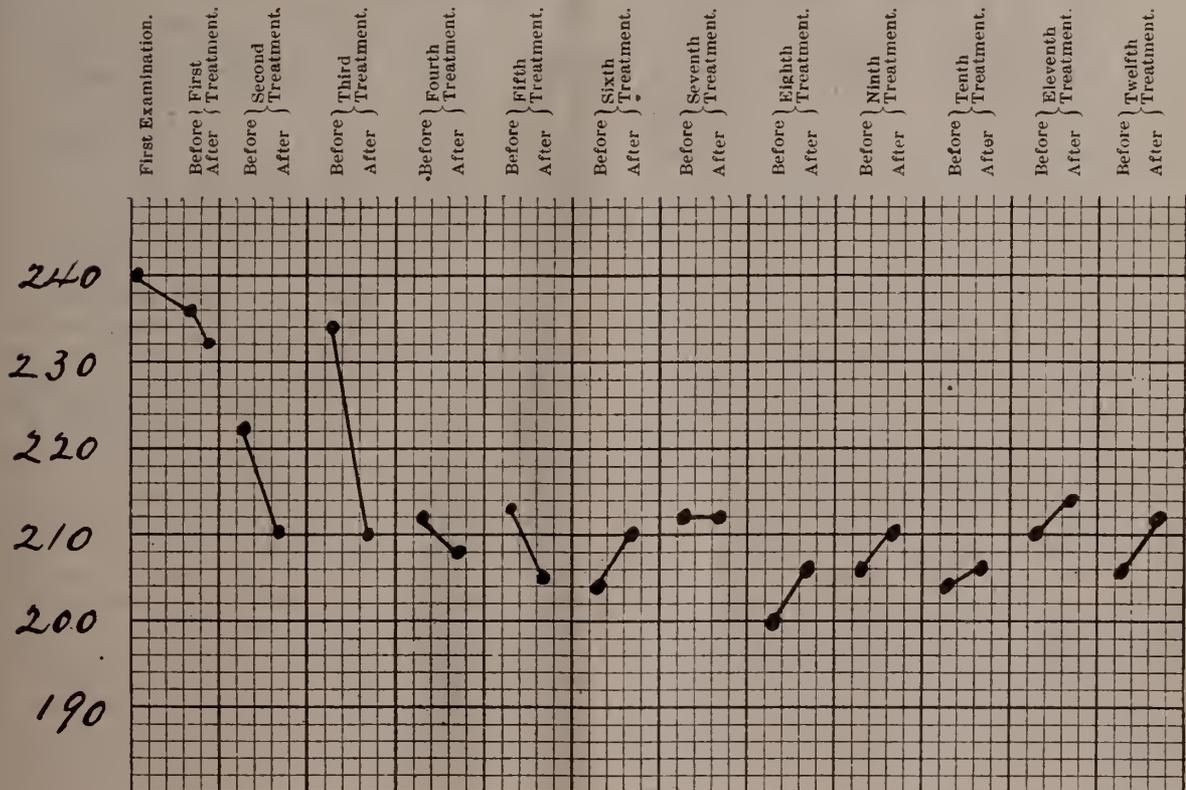


CHART VI.

DIASTOLIC PRESSURE BEFORE AND AFTER AUTOCONDENSATION TREATMENT.

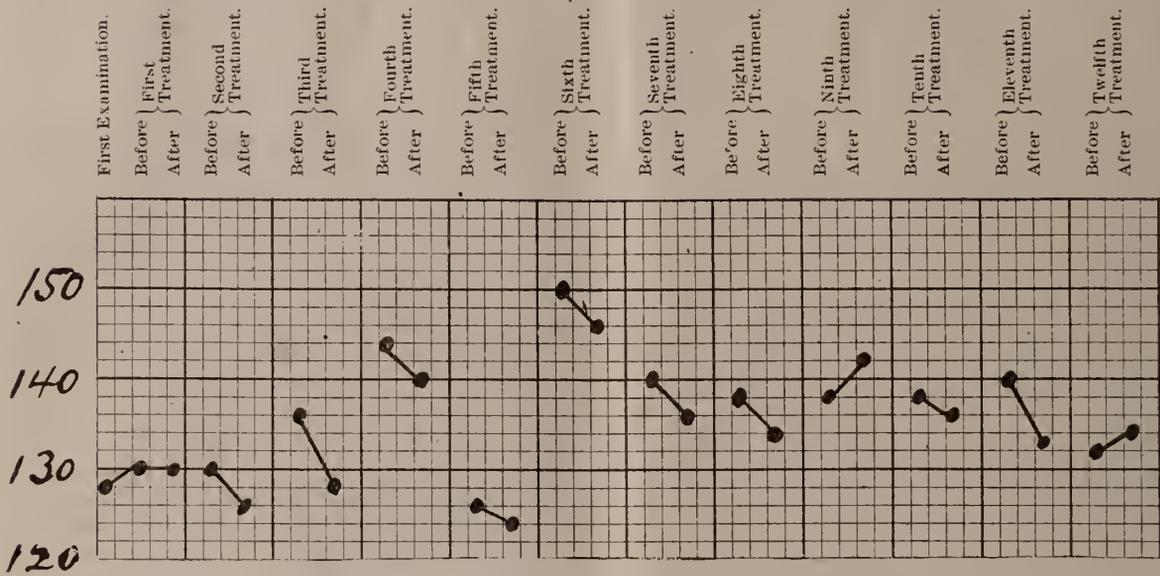
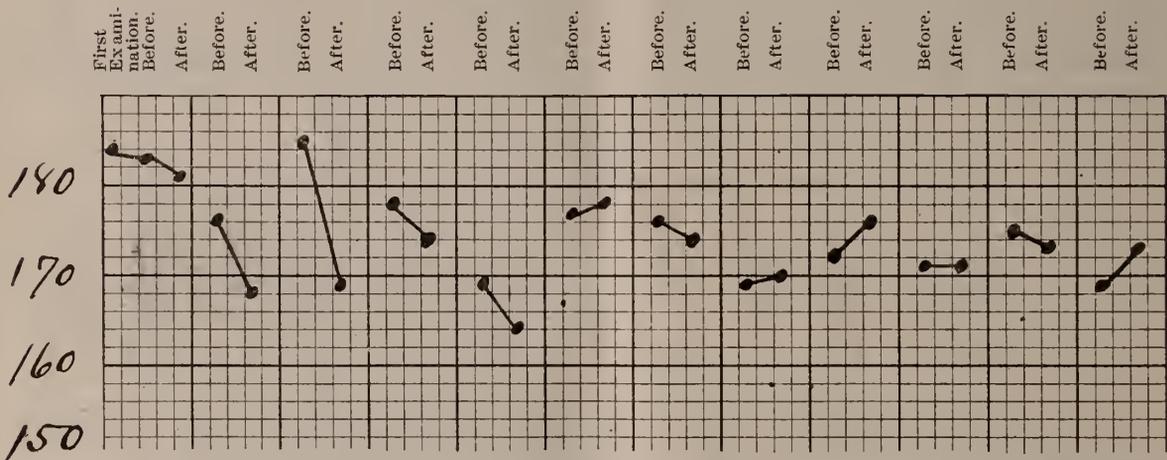


CHART VII.

MEAN PRESSURE BEFORE AND AFTER AUTOCONDENSATION TREATMENT.



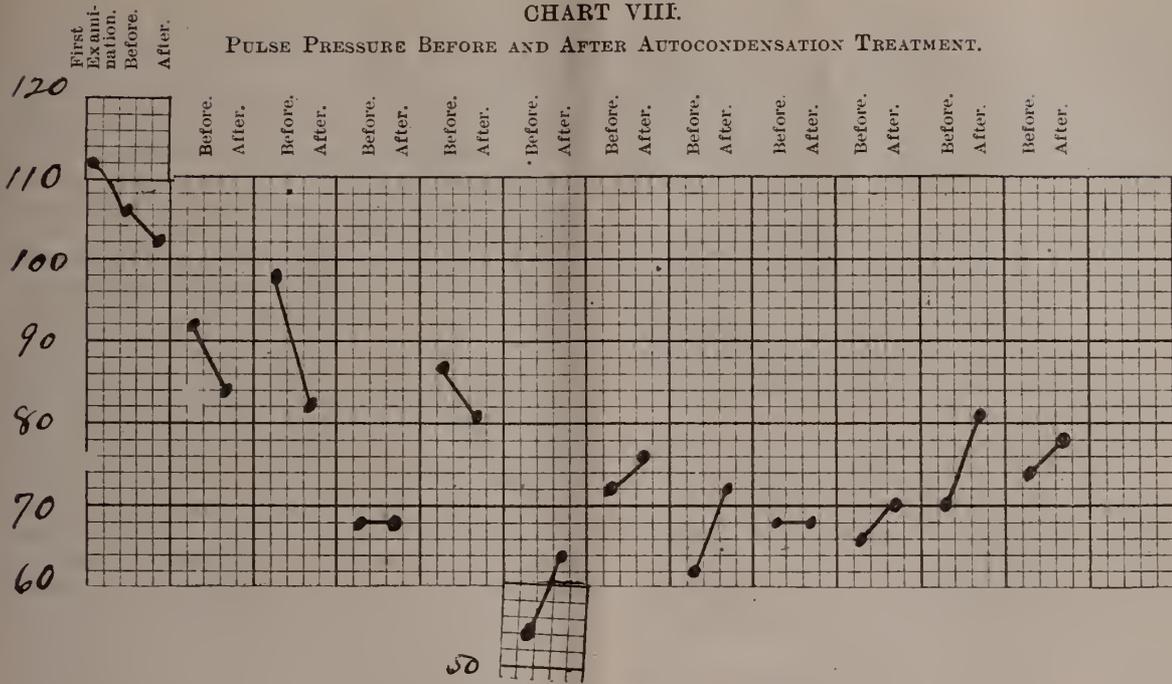
Following the administration of the high frequency current by the autocondensation method for 20 minutes the systolic pressure was reduced 5 times, raised 6 times, and uninfluenced once. The reductions amounted to 4 mm., 12 mm., 24 mm., 4 mm., and 8 mm., respectively, an average reduction of 10.4 mm. per treatment. The elevation of pressure amounted to 6 mm., 6 mm., 4 mm., 2 mm., 4 mm., 6 mm., respectively, an average raise of 4.6 mm. per treatment. The diastolic pressure was reduced 9 times, raised twice and uninfluenced once. The reductions in the diastolic pressure amounted to 4 mm., 8 mm., 4 mm., 2 mm., 4 mm., 4 mm., 4 mm., 2 mm., and 7 mm., respectively, an average of 4.3 mm. per treatment. The elevations of diastolic pressure amounted to 6 mm. and 2 mm. respectively, an average of 3 mm. for each treatment. The mean pressure was reduced 7 times, raised 4 times,

and uninfluenced once. The reductions amounted to 2 mm., 8 mm., 16 mm., 4 mm., 5 mm., 2 mm., and 4 mm., respectively, an average of 5.5 per treatment. The elevations amounted to 1 mm., 1 mm., 4 mm., and 4 mm., respectively, an average of 2.5 per treatment. The pulse pressure was reduced 4 times, raised 6 times, and uninfluenced twice. The reductions amounted to 4 mm., 8 mm., 16 mm., and 6 mm., respectively, an average reduction of 8.5 mm. per treatment. The elevations amounted to 10 mm., 4 mm., 1 mm., 4 mm., 11 mm., 4 mm., respectively, an average of 7 mm. per treatment.

Three days after the last autocondensation treatment was given the patient's blood pressure was as follows: Systolic, 210; diastolic, 138; mean, 174; pulse pressure, 72. This estimation showed the systolic pressure to be 30 mm. lower at the end of treatment than at the beginning;

CHART VIII.

PULSE PRESSURE BEFORE AND AFTER AUTOCONDENSATION TREATMENT.



the diastolic pressure 10 mm. higher at the end of the treatment than at the beginning; the mean pressure 10 mm. lower than at the beginning, and the pulse pressure 40 mm. lower than at the beginning.

by well marked benefit. Owing, however, to the unfortunate experience referred to it would seem that the treatment ought to be watched with great care.

1910.	Sys- tolic.	Dias- tolic.	Mean.	Pulse Pres- sure.
June 10, 1st Ex-amination	240	128	184	112
11, Before...	236	130	183	106
After...	232	130	181	102
13, Before...	222	130	176	92
After...	210	126	168	84
14, Before...	234	136	185	98
After...	210	128	169	82
15, Before...	212	144	178	68
After...	208	140	174	68
16, Before...	213	126	169.5	87
After...	205	124	164.5	81
17, Before...	204	150	177	54
After...	210	146	178	64
18, Before...	212	140	176	72
After...	212	136	174	76
20, Before...	200	138	169	62
After...	206	134	170	72
21, Before...	206	138	172	68
After...	210	142	176	68
22, Before...	204	138	171	66
After...	206	136	171	70
23, Before...	210	140	175	70
After...	214	133	173.5	81
25, Before...	206	132	169	74
After...	212	134	173	78

No patient who is afraid of the machine should ever be argued into taking this form of treatment. Dr. Katzenstein, the physician in charge of the mechanotherapeutic institute of the Hotel Nassau, Wiesbaden, has abandoned the use of autocondensation in cases of arteriosclerosis.

The passage of the high frequency current through a vacuum tube, with the production of ultra-violet rays, has a considerable value in the treatment of the cutaneous manifestations of arteriosclerosis such as anesthesia, hyperesthesia, and paresthesia. It seems to be of greater value than either faradism or galvanism.

For insomnia the static wave applied over the patient's head at bed time is often successful in the production of sleep and in the destruction of the necessity of hypnotics by mouth.

In giving the "crown breeze" as it is sometimes called, the positive pole of the static machine should be connected with the patient either by a metal plate on which his feet rest, or by a metal rod which he holds in his hands. The negative pole should be connected with the crown.

CONCLUSIONS.

1. Rest in bed with massage daily is capable of producing a marked reduction in the blood pressure of the patient suffering from arteriosclerosis.

2. The important details of the diet, for patients with arteriosclerosis are: first, to reduce the total amount of food; second, to reduce the

It would appear, therefore, that in this individual the autocondensation method was attended

amount of protein in the dietary; third, to limit the amount of fluid ingested.

3. Measures that will produce sweating; hot baths with blanket packs, Russian baths, vapor cabinet baths, and electric light baths are capable of reducing the blood pressure and ameliorating the symptoms in cases of arteriosclerosis with high blood pressure.

4. In thin patients the severer forms of treatment may be replaced by the administration of a neutral full bath of either fresh or salt water.

5. Carbonated brine (Nauheim) baths should not be given in cases of arteriosclerosis with high blood pressure, particularly when there are indications of nephritis.

6. Faradism, galvanism and the high frequency current applied to the skin through a vacuum tube are valuable in relieving anesthetics, hyperesthesias, and the paresthesias which are met with in cases of arteriosclerosis.

7. Autocondensation may reduce blood pressure, but the treatment should be given with great care.

8. The crown breeze, particularly if administered at bed time, is capable of relieving insomnia in some cases.

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THE NIGHT CAMP IN THE TREATMENT OF TUBERCULOSIS.*

By H. HOLBROOK CURTIS, M.D.,

NEW YORK CITY.

FROM every side we hear the din of the war against tuberculosis. Statistics as to the efficacy of the climate of many places, and remarkable cures made at certain sanatoria pervade our medical literature. Alas! how many there are suffering from the disease, to whom a change of climate or extra expenditure of any kind is an impossibility. What shall we do with our tuberculous population? As a representative of the first tuberculosis clinic, which was established in 1894 in New York City, now one of the twenty-two of the Association of Tuberculosis Clinics, working in co-operation with the Board of Health, it

may not be out of place to briefly outline our special work, as it is carried on to-day in the district.

From house-to-house visitation of a district nurse furnished by the Board of Health, every person found thought to be suffering from consumption is reported to that board and referred to the clinic of his district for examination and treatment.

Ambulant cases are advised to place themselves under the care of the clinic and to report one, two, or three times a week for treatment and advice. We have a daily clinic alternating for men and women and a night clinic for both sexes three times a week. Advanced cases are cared for at their homes until they can be accommodated at some of the city hospitals. These cases, however, are visited regularly by the visiting nurse of our clinic, who attends to the immediate wants of the patients, and supplies them, when necessary, with food, until they are placed in the care of some charitable society. Children of such patients, insofar as possible, are placed in homes or sent to preventoria. In our attempt to eliminate the disease from our district, the New York Throat, Nose and Lung Hospital has concluded that from an economic standpoint the best ends may be attained by caring for the family, and during the last year has attempted to better the condition of the families of those patients who are unable to work. The children are allowed to come to the hospital at 12 o'clock for a hearty dinner and may come on the order of our visiting nurse for a pint of milk at 10 a. m. and 3 p. m. This also applies to adults who are destitute.

Three years ago we opened out night camp for men in the incipient stages who were still able to work. The great success which has been achieved leads me to dwell upon this special feature of our system, for it seems more nearly to approach the desideratum of treatment in a crowded city than any yet devised.

Next door to our hospital happened to be an orthodox Jewish synagogue, built on the rear half of a city lot (25x100 feet), the front occupied by a four-story house similar in height to our hospital. This property was purchased by the trustees and the building reconstructed into a tuberculosis annex. The synagogue was made into a night camp by putting on an iron and glass roof which could be opened to permit of free ventilation. Twenty beds were placed in the 25x50-foot extension and eight beds in the galleries. There is also a bed for an orderly at the end of the room. Windows open from three sides, making it practically an open-air pavilion, the temperature of which is that of the outside air. In the room next to this is the shower bath, constructed from the sunken purification tank of the orthodox congregation, and adjoining is

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

the locker room with wash basins. Both of these rooms are steam heated. The large front room is used as a living room, where the patients spend the evening in reading and amusements. At one end is the milk bar, where at 10 a. m. and 3 p. m. milk is served in pint mugs to camp patients, and the badly nourished of our clinic patients and to their families. Clothing supplied by the night camp auxiliaries is also given to those in need. The orderly serves the milk and the visiting nurse keeps a detailed record of every family which is under the care of the clinic. Every home is visited by her, and the income, rent and home conditions noted. Our visiting nurse is also in touch with the visitors of the Charity Organization Society, the Association for Improving the Condition of the Poor, the Board of Health, the Hospital Admission Bureau, the Preventoria, as well as the various denominational charities in the neighborhood.

As we have set out to not only relieve the patients, but to eliminate tuberculosis from the district allotted to us, we proceed on the following theory, our experience having warranted these hypotheses:

First. In primary cases, the disease having been discovered in its incipiency, the patient must be removed from unsanitary surroundings. If still able to work, the night camp is advocated. This applies especially to men.

Second. In moderately advanced cases the patient at the clinic, and the family by the visiting nurse should be instructed as to the disposition of sputum, ventilation of the rooms, cleanliness, proper food and the importance of sleeping alone. If in poverty and out of work, the family must be nourished to lessen their chances of infection. In these cases the patient is advised to apply for admission to a country sanatorium, such as Otisville or Ray Brook.

Third. In the advanced stages, the patient must be removed to one of the city hospitals as soon as practicable, and the family provided for.

If, instead of waiting until the individual becomes a menace to his associates, he could be removed from his family and placed in a night camp where he could be properly cared for but still be allowed to work, we would have in a short time a great modification of the present alarming conditions. In order to do this, it would be necessary to have a night camp in every district. For those cases a little further advanced, carrying a slight temperature, a day camp would also be essential. This feature we have added by cementing the hospital yard, 50x50 feet, and erecting a shelter shed at one side to accommodate a row of steamer chairs. Here those men who are not yet able to work sit during the day.

We all recognize the difficulty we have in persuading patients in these two categories to

leave town and their families and go to institutions. They are, however, quite content to accept the opportunities we offer, and the results we obtain seem to justify us in advising, that the same good may be obtained by city treatment under these conditions.

The beds of the night camp are regular hospital beds with a mattress. Four army blankets are doubled lengthwise and sewed at the bottom and to the arm-pit of the open side, making it possible, by crawling into the top, to have a sleeping bag of from one to seven covers. The patients have a woolen sleeping suit, and in cold weather wear a sleeping cap with a cape at the neck. A paper spit-cup is attached to each bed. On rising at 6:30, the men go to the locker room and remove their pajamas. They then take a warm, followed by a cold shower, dress and proceed to breakfast. The dining room and kitchen are on the second floor. The meals are as follows:

Breakfast, 7 A. M.

	<i>Calories</i>
One pint of milk.....	325
One plate of breakfast cereal.....	150
Three boiled eggs	203
4 ounces whole wheat bread	320
1¼ ounces butter	280
Total	1,278

Luncheon, 10 A. M.

1 pint of milk	325
<i>Dinner, 12 Noon.</i>	
Soup	100
4 ounces whole wheat bread.....	320
1¼ ounces butter.....	280
8 ounces fresh meat.....	560
4 ounces starchy vegetables	80
2 ounces green vegetables	50
Dessert—pudding, custard, etc.....	100
Total	1,490

Afternoon Lunch, 3 P. M.

1 pint of milk	325
<i>Supper, 6 P. M.</i>	
1 pint of milk	325
4 ounces bread	320
1¼ ounces butter	280
8 ounces cold meat	560
4 ounces starchy vegetables	80
Dessert	100
Total	1,665

Total, 5,082 calories.

It will be seen that the diet is a very liberal one. The best evidence of this may be shown

by giving a weight record of a few cases treated at the night camp and recently reported by one of our attending physicians, Dr. Nathan A. Stark, in a paper read before the clinical society of our hospital.

CASE 1.—R. W. Age 18. Railway porter. Working at Rye, N. Y. American, with bad family history. Entered December 10, 1909. Weight 100 lbs. Apex of left lung affected. Discharged at his own request March 29, 1910. Lung cleared up, no cough, weight 123 lbs. Examined February 10, 1912, and found cured.

CASE 2.—J. G. H. German, baker. Age 28. Admitted November 11, 1910. Weight 132 lbs. Advanced consolidation of both lungs and in infiltration of larynx. Left February 15, 1912. Weight 154 lbs., throat well and lungs much improved. Entered sanatorium in Sullivan county.

CASE 3.—S. R. Russian. Painter. Married. Age 27. Admitted November 19, 1910. Weight 154 lbs. Family history of tuberculosis. Apex of one lung involved. Discharged February 16, 1911. Weight 172 lbs. Evidently arrested case.

CASE 4.—M. B. Tailor. Age 22. Admitted December 2, 1911. Moderate affection of both apices. Weight 130 lbs. Left February 17, 1912. Weight 145 lbs. Very much improved.

CASE 5.—F. B. Austrian. Age 48. Valet. Bad family history. Admitted November 23, 1911. Patient in reality too far advanced for camp. Right lung, apex consolidated and left apex infiltrated. Bad laryngitis. March 6, 1912. Patient still in camp. Very much improved. Larynx well, lungs remarkably improved; weight on entrance 148, now 171 lbs.

CASE 6.—J. J. December 11, 1911. Age 21. Swedish. House servant. Weight 149 lbs. Infiltration of right apex. March 11, 1912. Patient feels well. No rales to be heard over diseased area. Weight 159 lbs.

CASE 7.—B. B. Tailor. Age 24. Infiltrated left apex. Admitted December 21, 1911. Weight 108 lbs. Left for sanatorium at Liberty, N. Y., January 27, 1912. Weight 124 lbs. Rales have disappeared.

CASE 8. J. K. American. Age 33. Salesman. Family history tubercular. Admitted January 3, 1912. Weight 138 lbs. Infiltration of right apex. Rales above third rib, very marked. February 24, weight 155 lbs. Rales absent, no cough; temperature normal. Arrested case.

CASE 9. M. D. American. Age 35. Actor. Admitted to camp December 15, 1911. Laryngeal tuberculosis. Ulceration of right cord. Infiltrated arytenoids. Weight 145 lbs. This patient improved wonderfully. January 20 all symptoms had disappeared, cord healed, aryte-

noids normal. Weight 162 lbs. Went to country for after-cure.

CASE 10.—G. S. Age 57. Admitted November 4, 1911. Weight 135½ lbs. Present weight 150½ lbs.

CASE 11.—L. L. Age 20. Admitted January 4, 1912. Weight 130 lbs. Discharged February 18, 1912. Weight 137 lbs.

The above mentioned cases are introduced to illustrate the enormous gain in weight that follows, when our patients are allowed to sleep in the open air and feed on the most nutritious and well-cooked food. The conclusions arrived at from an analyses of 92 cases treated in two years and a half at the night camp are most interesting and instructive. We claim that better results are obtained than when the patients are sent away. First, because they are in touch with their families and more contented; and, secondly, they feel that the condition is not such a serious one as to warrant a removal to an isolated sanatorium.

The night camp allows patients in the first stages of the disease to continue their occupations, provided that progressive weight and diminution of symptoms goes on.

Moderately advanced cases are put in the night and day camp, where they spend the day in steamer chairs in the open air and submit to rest and forced feeding. These are generally cases which in the past would have been consigned to hospitals where they would be in contact with advanced cases and thereby lose the courage and hopefulness which is an ever present atmosphere among the patients at our institution. There is a feeling here that everybody is getting better all the time, and, as we all must admit, hope and confidence is a powerful adjunct to treatment.

The cases in the third stage we do not discuss, for they do not come into the class we are aiming to help. Our aim is to direct all our energies to building up the families of the latter that they do not contract the disease. To this end we allow the families of the advanced cases in our district to come to the hospital for a good dinner and supply them with milk until such time as we can place them in the care of societies who make that their principal aim.

From an economic standpoint it would be an enormous saving in the end to the taxpayer, if the above system which we have evolved were generally adopted. Provided cases could be discovered in the initial stage and, segregated as we suggest, even if the families of some had to be assisted, there would be no need of the enormous hospitals so tardily in process of construction. Comparatively few cases would advance to the third stage, and through the educational methods taught to-day by our clinics the

spread of the disease would be checked if not entirely prevented. The Association of Tuberculosis Clinics is doing a mighty work, but each with a day and night camp would be in a position to effectively control the disease in a very few years, and at a minimum cost to the city. Liberal municipal aid should be given for the establishment of camps and preventoria rather than to hospitals erected for the treatment of third-stage patients. The eradication of the disease depends on the stoppage of infection, as much in tuberculosis as in the other contagious diseases.

The first night camp was instituted in the city of Albany, by a labor union. May its example be followed by every town and city in the union, for experience has shown that it is the cheapest and best method of dealing with this perplexing proposition.

Few institutions have the money to accomplish this work without the aid of auxiliaries. In our hospital we ask thirty houses in each block in the vicinity to contribute twenty-five cents a week, \$12 a year. Each block thus provides for one bed in the camp and the care of the patient. We have thirteen such auxiliaries and hope to have thirty. Special donations are made by individuals for food and clothing. The money goes for nourishment and assistance to needy clinic patients and their families. Our visiting nurse purchases the groceries and her bills are audited by a committee from the auxiliaries. She also gives hospital dinner and milk tickets as above described. These minor details have been added to give some idea of the plant necessary for the equipment of a night and day camp.

REMARKS UPON SOME RECENT STUDIES IN THE PATHOGENESIS OF EPILEPSY.*

By L. PIERCE CLARK, M.D.,

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TWO new lines of advance have been attempted in the last few years to elucidate the problem of the nature and treatment of epilepsy: (1) that upon the hereditariness of the disease, and (2) the bearing which disorders of metabolism and perversion of the internal secretions of the ductless gland have upon the pathogenesis and treatment of the disease. Neither study is complete enough in point of time and material for us to formulate a definite hypothesis. However, regarding the first line of study, that of the hereditariness of the idiopathic type of the disease, it may be said that it has not been shown either by Davenport and Weeks or Griffith that the heredity acts as a so-called Mendelian

unite in transmissibility, nor is the data for such a contention anywhere near as suggestive in this respect as the brief held by the eugenists for the hereditariness of feeble-mindedness. The reason for this is not far to seek, as the so-called idiopathic disease is probably complex in its make-up. Besides, the cases making up the idiopathic group are changing, inasmuch as the group constantly suffers reduction as certain types are being withdrawn and classified under more or less definite ascertained physical causes in the patients' own make-up. Idiopathic epilepsy is thus seen to be advancing along the same roadway, from a nosological point of view at least, as that of the loose and inconclusive term *dementia* in scientific psychiatry. Not so many years ago, it will be remembered, secondary dementia embraced a large class of the insane. Now the term has largely vanished in its more exact component of the *dementia præcox*, paralytic dementia, epileptic and alcoholic dementia, etc.

However, the therapeutic nihilism which at first might seem to be entailed, were one to accept the present-day eugenic studies of hereditariness of the idiopathic epilepsy, is foiled in greater part by the facts that the presence of hereditariness is no bar to recovery from epilepsy. Indeed, it would seem to be *for* a good prognosis rather than against it, as shown by numerous studies, and especially in my own data where two-thirds of the recoveries were recruited from the hereditary cases. It seems quite likely that the heredity element renders the epilepsy permissive and not mandatory, in which case the host of infectious elements and perversions of bodily metabolism are doubly important in the study of the pathogenesis of the disease as well as in the search for the means of overcoming the same. To a critical review of the work in this latter field we shall now confine our attention.

The question has risen recently whether certain chemic constituents, such as calcium salts, the replacement of which in certain forms of tetany has been of such remedial value, may not also warrant therapeutic trial and use in the idiopathic epileptic. The presence of the idiopathic oedemas, the capillary stasis in epileptics in brain, lungs and kidneys, have all pointed to the possible use of the calcium salts in this disease. Although some improvements have been reported, especially in youthful epileptics and when administered at the inception of the disease, its general use has given no very satisfactory results. I have tried it rather extensively in specially selected cases, but with no great benefit. However, Lallement and Dupony would seem to advance its use in youthful epileptics and report some degree of betterment in this stage of the disease. In all probability our form of administering the drug by the mouth is a very crude method of getting it into the system as compared to the bodily economy in absorption.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

Probably the best therapeutic guide for the more or less successful treatment of epilepsy in modern times has been based upon a proven, or, what is more frequently assumed, basis of autotoxemia. However much the name and theory has lacked in scientific investigation and proof, when one works upon this assumption, giving the patient a thoroughly detailed system of training treatment, in which diet, exercise, occupation and the thorough elimination by the kidneys, bowels and skin is carried out, one gains in return the best results in treating the idiopathic epilepsies. I have detailed the scheme at length in another place, and it is mentioned at this time to show that the plan is quite in accord with recent investigations such as that illustrated by Guelpa and Marie,¹ who made extensive efforts to control epilepsy by what they are pleased to call detoxication and reëducation of the alimentary canal. The patients received no food of any kind for the first four days, but were given laxatives instead. Later on they received only a vegetable diet, in limited quantities. This series was repeated every eight days. The patients cheated so much in regard to what they actually ate that the regime could be carried out only in a very few cases. Favorable results were obtained in some instances, but the patients relapsed when errors of diet were committed after their discharge. Improvements was found to run a parallel course with the patient's loss in weight.

When the digestive apparatus has been put quite right, at least so far as one is able to judge, the great majority of epileptics (about 80 per cent.) still continue at more or less regular intervals to have seizures. For a long time investigations have been undertaken to determine the toxicity of the blood in those idiopathic epileptics. One of the most recent investigations was undertaken by Meyer² of Germany, who endeavored to ascertain the toxicity of the blood of genuine epileptics as compared with that of normal individuals and non-idiopathic epileptics—the possibility of producing convulsions through injections of such blood—the existence of qualitative variations of these phenomena, after such injections, according to whether the blood has been derived from different kinds of epilepsy, alcoholic epilepsy, or other remote forms, as compared with genuine epilepsy. It was of special interest in ascertaining the convulsion-producing properties of the blood, when this had been obtained during the interval-period free from attacks. The technique of the experiments consisted in the withdrawal of blood from the ulnar vein and its immediate intraperitoneal injection into guinea pigs. The quantity of the injected blood varied between 10 to 20 cm., according to the size of the animal. Those animals which survived the injection and the convulsions were treated for a second and third time with epileptic blood, the term of the new injection always being selected in such a way that anaphylaxis had not had time to develop.

The animals were usually somewhat restless, directly after the injection, and then became very shy and non-responsive to stimuli of all kinds; this condition lasted only a very short time in those animals which had been treated with non-epileptic blood.

The attacks of the animals which had received epileptic blood were characterized by clonic-tonic muscular twitching of usually all the extremities, the animal in most cases lying on its side. The duration of these spasms varied, but the convulsions appeared in series, with more or less prolonged intervals, generally a few minutes apart. The animals dying after the first injection usually presented the picture of oposthotonus. Those which did not die after the first injection were injected again, as soon as they had entirely recovered, but always before the tenth day. In three experiments with interval blood from patient whose interval-blood has produced convulsions at the first injection, no convulsive phenomena were noted when the animals received preliminary treatment with normal blood.

In the last experiment series, *i. e.*, those animals which received a second injection of epileptic (not interval) blood, no typical spasms followed in the majority of the cases, seven of ten times, in contradistinction to those treated for the first time with epileptic blood. The impression is thus conveyed, as of a preliminary injection which in six cases consisted of normal blood, in the four others of epileptic blood, had already induced a certain habituation to the poison. Further investigations along this line are still needed.

A review of the experiments—which Meyer wished to be regarded merely as preliminary investigations—seems to show that the assumption of a toxæmic epilepsy is certainly justified, in so far as in a long series of cases, the blood of genuine epilepsy (especially when withdrawn at the time of the attack) is capable of producing convulsive phenomena of a very special type, in animals; resembling the effects of picrotoxin-poisoning. It is noteworthy that in the majority of the cases, these convulsions bear a very definite character, which differs from that noted after injection of blood from non-genuine epileptics.

Remarkable analogies to these findings are supplied by the hypertoxicity of the urine after the attack, as compared to the free intervals, and the non-toxicity of the urine of normal individuals; according to the older investigations of French writers (Voisin, Petit), and especially the recent publications of Loewe. He showed that these toxic substances in the urine are the adialysable substances which are increased after the attack, and which on injection into guinea pigs and rabbits, gave rise to spastic phenomena similar to those referred to above, after the injection of epileptic blood.

Although Loewe also noted a toxic effect of adialysable substances in other psychoses, he also

pointed out the characteristic form of the convulsions and their resemblance to true epileptic seizures, as the urine of epileptics was found to act differently from the urine of other psychoses.

Concerning the number of positive adialysates from the urine, as compared to the blood, Loewe notes 39 positive cases among 50, or not quite 80 per cent. In the tests of the toxicity of the epileptic blood, 2 among 18 experiments were negative, or about 10 per cent. The percentages of the toxicity values of the adialysates of the urine therefore show entirely favorable proportion to those of the blood.

A second experimental series was conducted for the purpose of ascertaining in which constituent of the blood the poisonous substratum is contained. The serum was found in all cases to be the efficient toxic substratum, in the epileptic blood, the blood corpuscles proving harmless.

The experiments furthermore show an interesting dependence of the efficiency of the toxic substance, upon the *time* that has elapsed since the last attack. Apparently, this poison—which may be assumed to be of endogenous origin in the organism, where it gradually accumulates until at a certain point the motor explosion takes place, in form of the attack—should not be looked for in the general circulation, but is gradually given off to the blood current from the place of its formation, and can only be demonstrated as a toxic constituent in the blood at a time not very far from the explosion.

With special reference to the apparent habituation of the animals to this poison—as indicated by some of the experiments, and in agreement with certain clinical observations—the idea naturally arises that this endogenous toxic agent of mysterious origin may possibly be related to some function of organs with internal secretions; either through over-production of such secretions, or through some hypo-function, in analogy with other affections of this system. In this connection, Claude and Schmiergeld claim to have discovered lesions, in the sense of lost function, of certain glands with an interval secretion, notably the thyroid in epilepsy.

In 12 cases examined by Claude and Schmiergeld,³ these changes were found to be very profound the thyroid presenting atrophic sclerosis, mixed with small zones of compensatory hypertrophy. More or less pronounced changes were also demonstrated in the other glands; hypo-function of the parathyroid glands, the hypophysis, the ovaries, complete destruction of the suprarenal through a hemorrhagic cyst. Analogous changes were found in a number of other cases; whereas in seven cases of symptomatic epilepsy (with simultaneous dementia and organic disease of the central nervous system), the modifications of the endogenic glands were not so pronounced.

Until the site of formation of this toxic substance has been discovered, investigations are in

order to confirm the existence of a toxæmic epilepsy through special physiological properties, characteristic of the toxic substratum. From the investigations of Meyer and others, as just detailed here, one gains a proper contempt of any narrow therapeutic concern in suppressing the individual fits in epilepsy by sedatives or otherwise. It may be justly argued, indeed, that the suppression of the individual seizures of epilepsy is not only a narrow view of the disease, but may prolong and continue the disease through preventing the system's riddance of positive and harmful toxins.

There are those who justly maintain that the term "genuine epilepsy" should be reserved for that symptom-complex exclusively, which is produced through an intoxication.⁴ The organism of epileptics has lost the normal capacity of elimination of neutralization of certain products of the metabolism, which are characteristic by their great toxicity, and affinity to the nervous system, more particularly the cerebral cortex. When the increase of these toxins, which gradually accumulate, has reached a certain degree, the body endeavors to get rid of these poisons, through attacks or convulsions, or other psychic disturbances. Nothing very definite is known concerning the chemistry of these substances, which are presumably derived from the nitrogen series. Krainsky still assumes that ammonium carbamate plays a part in this connection, and Danaki refers to ammonium, or amin bases. Their respective positions on this subject still remain isolated without great hypothetical and little clinical support.

The organism undoubtedly undergoes a loss of phosphorus, under the influence of the attacks. Anatomical changes of the brain can no longer enter into consideration, in the true etiology of epilepsy. Its real pathogenesis is a systemic disorder, a worthy field of investigation by team work of the neurologist and internist.

In a search for the prompting agents endogenous in origin which may produce the metabolic disturbances of the epileptic, serious attention has been paid to organotherapy and opotherapy, the juices or secreting substances from these glands. My experience in four cases under my personal care tallies with that of Mariet and Bosc,⁵ who not only obtained no diminution of the attacks but on the contrary noted an excess of seizures. In their cases the ingestion of the pituitary gland produced attacks of delirium which appear three or four days after the administration of the gland, and in certain cases assumed the characteristic features of the epileptic excitement; apparently these attacks have a distinct causative relation with the ingestion of the gland. The great variation in different preparations and the inexact physiologic action of pituitrin makes this line of therapy very questionable.

Time and space forbid an analysis of the

studies of the metabolism and perversion of bodily secretions, including the obscure functioning of the ductless glands. Suffice it to say that any present-day therapy based upon them must still be too imperial in character to be used as clinical guides in the successful management of this most baffling disease.

To summarize: (1) Genuine epilepsy would seem to be dependent upon certain unknown complex heredity factors producing a form of cortical and subcortical instability upon which a variety of endogenous toxins may act, causing the disease.

(2) The fit is an exhibition of a reflex action of the disease and as such should not be seriously interfered with by sedatives *per se*. The sedative treatment of epilepsy is therefore to be thoroughly discouraged so long as there is hope of bringing the real clinical pathogenesis of the disease under control. The above rather obvious truisms may seem trite and commonplace to many, but the sedative treatment is still the main one followed by the majority of physicians to-day.

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THE EFFECT OF SALVARSAN ON THE EAR.*

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THE efficacy of 606 has now been demonstrated in results obtained by its administration over 1,000,000 times. That it has perhaps fallen somewhat short of the first expectations is but natural. That one or two administrations produce a sterilization of the blood as far as the syphilitic poison is concerned so that further treatment is unnecessary, may be considered the exception, not the rule.

As otologists we are concerned with the effect of salvarsan upon the ear. First, as a therapeutic agent in treating specific processes involving the ear or manifesting themselves by interference with the auditory or vestibular functions; and second, a consideration of the aural complications in cases treated with salvarsan, whether these are caused by syphilis or can be attributed to the remedy itself.

For all syphilitic manifestations of the auricle or auditory canal, as well as of the middle ear, salvarsan will be found very effective. In cases of deafness in which tests show labyrinthine, or nerve involvement, we may also expect much from its use. By older methods we have had fairly good results if we could begin our treatment early. I will relate a case illustrating this point. J. S., age 30, consulted me on November 13, 1909, for marked impairment of hearing in right ear which had existed for two days; contracted syphilis four years before, was supposed to have been thoroughly treated; hearing in involved ear, forced whisper one inch, bone conduction reduced; positive Rinne, Weber to good ear. Put upon large doses of K. I., and two weeks later ordinary whisper at three feet. Improvement continued until at end of a month hearing nearly normal.

In order to obtain such a result we must see the case early before there is irreparable injury to the nerve or labyrinth. When the symptoms have existed for a longer time our treatment has generally been of no marked value; but even in these cases we may expect more from salvarsan, as the following case will show:

Male, 29, came to my clinic at University and Bellevue Hospital Medical College on November 28, 1911. History of initial lesion obscure, but about two and one-half years ago had general eruption which disappeared without much treatment. One year ago became deaf. Examination showed both canals and membranes normal. Right ear totally deaf; left bare perception for shouted voice. In fact, all intelligent communication with patient was held in writing. Bone conduction absent. No nystagmus after rotation. Wassermann positive. Intravenous injection salvarsan December 12th. His hearing began to improve soon after, and on January 2d gave voice on right and forced whisper near the ear on left. It was easy to carry on conversation with him. Both labyrinths reacted although less than normal, and some bone conduction had returned. A second dose of salvarsan was administered, but without further improvement, and he was put upon mercury and iodides. On February 1st condition remained the same. The value of salvarsan is shown very plainly in this case, and also in a series of cases which will be briefly abstracted below.

In cases of syphilis treated with salvarsan we have in a comparatively small number involvement of the cranial nerves. These neuro-recurrences may come on at various periods after the inception of the disease, or the administration of the "606." From some articles on the subject one would receive the impression that these nerve involvements were comparatively rare before the days of salvarsan, and especially so during the early stages of syphilis. Let us cite a few observations to show the fallacy of this view.

Benario¹ has gone over the case reports sent

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

to Ehrlich and has collected therefrom 29 cases of neuro-recurrence after mercury. In ten of these which he has reported in another place,² there was involvement of the eighth pair and are here briefly given:

I. Woman, 23. Mercury salicylate injections. Complete deafness in one ear, partial in the other. Oculo-motor palsy. After two injections of salvarsan complete cure.

II. Male. Mercurial treatment. Facial and auditory palsy three months after infection. After salvarsan disappearance of symptoms in three days.

III. Female, 21. Forty mercurial injections. Six months after infection facial palsy and almost complete deafness; diplopia and ptosis. Disappearance of facial palsy after mercury. After salvarsan disappearance of diplopia and improvement in hearing.

IV. Male, 22. Forty mercurial injections. Five months after infection right facial palsy and deafness. Not improved after salvarsan.

V. Male. Five injections of insoluble mercury salts. One month after infection almost complete deafness. After salvarsan hearing restored to normal.

VI. Female, 39. Eighteen injections salicylate of mercury. Three months after infection partial deafness in both ears; could not hear conversation. After salvarsan hearing greatly improved and eventually returned to normal.

VII. Female, 34. Three months after infection partial deafness. After salvarsan rapid improvement with return to normal.

VIII. Woman, 30. Eight mercurial injections; several months later tinnitus, vertigo and partial deafness. Cured by mercury.

IX. Complete deafness during second stage. Could not hear a pistol shot. Mercury used without result. Improvement under salvarsan. Hears loud conversation.

X. Musician. After mercurial treatment developed tinnitus and impaired hearing. Under salvarsan relief and cure of deafness in number of weeks.

Otto Meyer³ has examined the records in the Grazer Ohren Klinik since 1896, and found 65 cases of syphilitic disease of the acoustic apparatus, of which 13, or 20 per cent., occurred during the first year, to which Prof. Haberman⁴ adds: 66 seen in the same clinic prior to 1896, of which 34 occurred in the second stage; making a total of 131 cases seen in the Grazer Ohren Klinik in the days before salvarsan.

Mauriac⁵ collected 168 cases of syphilis of the central nervous system, of which 53 occurred during the first year. Naunyn⁶ has collected and observed 305 cases of cerebral syphilis, and in these

20 per cent. showed their nerve symptoms within one year after infection.

As to the neuro-recurrences after the use of salvarsan, Benario, of Frankfort, has collected 126 cases from reports of over 14,000 cases treated by 606. Nine of these were cases in which the interference with function was analogous to the Herxheimer reaction of the skin, coming on soon after the injection and passing away in a short time. In this reaction there is a temporary increase in the dermal symptoms supposed to be due in some way to the action of the arseno-benzol upon the spirochætæ contained within the syphilide. Of the 126 cases the eighth nerve was involved 62 times, optic 41, oculomotor 8, trochlear 2, abduceus 3, and facial 10.

Benario calls attention to the greater danger of neuro-recurrence in extra-genital infections, and especially in chancres of the head. In his 126 cases, 13 had extra genital chancre, and 9 were of the head. Cases presenting the papular syphilide were more liable to be effected, as in 66 in which the variety of skin eruption was specified 36 were papular.

Nonne⁷ has called attention to the fact that the papular exanthem denoted a malignant type of syphilis, liable to be followed by cerebral complications.

Benario mentions the fact that in 3,200 cases treated by Arning, Doerr, Frühaut, Duhot, For-dyce, Neisser and others, no neuro-recurrences have been observed. He concludes that the nerve involvements are specific in nature and not due to the salvarsan, and gives the following reasons for this belief:

I. The long interval between the injection and the appearance of nerve symptoms.

II. The character of the process in optic nerve involvements, which is an inflammation or irritation in most cases, as shown by Schanz⁸ and Tobias.⁹

III. That the condition appears during a determined period of syphilis.

IV. Which is followed by those cases treated with salvarsan, as shown by a comparison of these cases with those of Muariac, who reports 53. or 20 per cent, as occurring within the first year after infection.

Mauriac.		Salvarsan.	
Month.	Cases.	Month.	Cases.
1	3	1	5
2	4	2	10
3	5	3	15
4	7	4	26
5	4	5	29
6	6	6	17
8	2	8	5
9	2	9	4
10-14	20	10-14	8

12.8%

12.6%

24%

24.6%

18.4%

38.9%

7.2%

7.6%

V. Their curability by specific medication, especially 606.

VI. The symptoms seem more liable to follow small doses of salvarsan, which of course would not be the case if they were caused by the toxicity of the remedy.

VII. And that exactly the same symptoms follow after the treatment with mercury.

A few observations might be mentioned in support of these views.

H. Frey¹⁰ observed a syphilitic for three months. Two months after administration of salvarsan internal ear involvement occurred, followed in five days by dermal recurrence.

B. Spiethoff¹¹ reports a case in which, six weeks after injection of salvarsan there was internal ear involvement. Wasserman mixed treatment for five days without effect. Two new injections of 606 produced amelioration of the patient in several days.

Werthier¹² reports two cases of internal ear involvement following salvarsan, which disappeared under mercury, and a third which persisted in spite of mercurial treatment disappeared under salvarsan.

Geronne and Gutmann¹³ in six cases obtained a cure or amelioration of the internal ear involvement following salvarsan by the further administration of the same remedy (obs. 3, 4, 9, 11, 12 and 13); in a seventh case under mixed treatment (obs. 8); and in one patient (obs. X) who would not accept another injection, the condition persisted.

Ehrman¹⁴ reports a case of internal ear involvement after salvarsan cured by a course of mercurial inunctions, while M. V. Zeissl¹⁵ reports still another cured by mercurial treatment.

On the other hand, Peritz¹⁶ reports a case of neuro-recurrence of the eighth nerve following 606, which did not disappear even after the third injection of salvarsan, and there are some others of a like nature recorded.

Ingersheimer¹⁷ has made a comparative study of atoxyl and salvarsan. He arrives at the conclusion that the acid radical phenyl-arsenic is the cause of the toxicity of the atoxyl. This is not found in 606. After injection of salvarsan in dogs and cats he was unable to find the lesions characteristic of poisoning by atoxyl. He therefore thinks that poisoning by arseno-benzol is not to be feared. Of interest in this connection are the experiments of Paul Rothig¹⁸ who by injecting arsacetine into ordinary mice has caused them to perform the movements of the Japanese dancing mice and found upon examination of the nervous system besides various other lesions a degeneration of the vestibular nerves; and according to Seegman,²⁴ Beck at Urbantschitsch clinic has produced the same result with salvarsan. So it seems that these preparations of arsenic have (so far as white mice are concerned)

what we may call a selective affinity for the vestibular nerve, or find here a point of least resistance. That the earlier ear symptoms following 606, those likened to the Herxheimer reaction, are for the most part at least limited to the vestibular apparatus, is somewhat suggestive in this connection.

Victor Urbantschitsch¹⁹ notes that in sixty cases sent to the Ear Clinic for examination after injection of 606, five had disturbances of the vestibular functions, appearing three hours, five hours and three days respectively after injection, and disappearing in from ten to fifteen days later. In the fourth case appearing five weeks after injection disappearing in seven weeks, and the fifth case appearing four weeks after the administration was still present in tenth week.

Biehl²⁰ reports the case of a soldier who had vestibular symptoms for two hours after injection, hearing remaining unaffected.

O. Beck²¹ has taken up the subject of vestibular involvement after salvarsan and has reported a number of interesting cases and discussed the possibility of exactly locating the lesion by tests. He is inclined to consider the condition as analogous to the Herxheimer reaction.

Numerous explanations have been advanced to account for these neuro-recurrences. I will mention but two.

Ehrlich²² contends that the 606 produces a sterilization through the blood, except in some of the osseous canals through which the cerebral nerves pass. Here the circulation being sluggish a few spirochætæ are enabled to escape the action of the remedy and proliferate causing an inflammation (an osteo-periostitis, perhaps), and swelling with pressure upon the nerve with consequent interference with function.

Nichols²³ advances the theory that after administration of 606 most of the spirochætæ being killed at once no natural resistance is established so that some focus in the nervous system which has escaped finds its development unopposed after the elimination of the salvarsan. After mercurial treatment natural resistance is established, as the spirilli are not killed so rapidly. Both of these theories are consistent with the observation of the serum reactions. A great many of these cases develop the neuro-recurrence while the Wassermann reaction is negative. Later, as a rule, if treatment is not promptly instituted it becomes positive, while in a certain number the reaction has been positive at the time of the neuro-recidiv. The presence of a small focus of the spirochætæ may occur with a negative reaction, but as they develop and their presence becomes general the reaction changes to positive.

A consideration of the above would go to show that the best way to prevent nerve involvement after salvarsan is to associate its administration with mercury and iodide of potash and to repeat the injection as often as may be necessary.

After development of the neuro-recidiv the

treatment consists in additional doses of the 606, associated with mercury and the iodides.

In conclusion would say that I have been unable to find any evidence to show that cases with slight deafness were made worse by salvarsan. So that aural symptoms non-specific in origin do not contra-indicate the administration of 606, and if they are caused by some process, specific in nature, they furnish a positive indication for the administration of the remedy. The contention of some that 606 is not to be given in mild degrees of impairment of hearing or in unilateral deafness, on the ground that it is liable to destroy the remaining hearing power, is not supported by the facts, and to restrict the use of salvarsan to those cases in which the deafness is so extreme that nothing could make it worse would be to deprive many patients of their best remedy to conserve and improve the hearing which they possessed.

Since writing the above the exhaustive monograph of Benario²⁸ has appeared. He arrives at the same conclusions as in his former articles. He records 194 cases of neuro-recurrence after salvarsan, of which 79 are of the eighth pair, 63 alone and 13 associated with involvement of other nerves.

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EFFECTS OF SALVARSAN ON THE EYE.*

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SALVARSAN has become an indispensable adjunct in the treatment of ocular lues and the only contraindication to its use is simple atrophy of the optic nerve. The reason for this opinion is—there are no cases of tabes dorsalis or general paresis that have been benefited by its use and in instances of spinal atrophy of the optic nerve—which sometimes accompanies these parasyphilitic affections—the administration of salvarsan has apparently hastened the inevitable end.

One case that has come under my observation was that of a man who had locomotor ataxia seven years and for three years his vision had gradually failed. On examination in May, 1910, he had vision R. E. 20/50, L. E. 20/200, concentrically contracted fields and the typical picture of tabetic atrophy of both optic nerves. At a subsequent examination in October, he had no perception of light in either eye and gave a history of having had an injection of salvarsan in August and stated that six weeks after the injection he was totally blind. One would naturally infer if it took three years to reduce the vision to 20/50 and 20/200 respectively, sight would not have been completely lost in five months if salvarsan had not been used. Becker¹ reports a similar case.

However, if salvarsan hastens spinal atrophy of the optic nerve, it is not alone in this action, as mercury unquestionably possesses the same fault.

Stargardt² claims that degeneration of the ganglion cells in the retina in tabes dorsalis is a secondary process and both simple atrophy and these changes are due to the direct action of the spirochaetes and are not parasyphilitic in any sense. If this hypothesis be true, salvarsan should be more beneficial.

Igersheimer³ found that repeated injections of salvarsan failed to produce in rabbits and a dog any toxic symptoms, ophthalmoscopic changes or microscopic lesions, but in cats he found marked degeneration of the ganglion cells of the retina with slight changes in the nerve. The loss of hair was marked, indicating a toxic action due to slowly evolved inorganic arsenic.

The deleterious effects in man are inconspicuous when one finds that more than 60,000 cases have received this potent arsenical compound with no authentic cases of amaurosis following its use. In the hundred cases in which the fundi were examined by the writer prior to the injection of salvarsan and reported by Fox and Trimble,⁴ it had no injurious effects on the eye in any way.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

Let me cite the following cases showing when I advised salvarsan and when I did not:

Two patients were sent to me for an examination of their eye grounds, prior to salvarsan injection. One, a man fifty years of age with cervical tabes, Argyll-Robertson pupils, 20/20 vision, normal patellar reflexes, aortitis, positive Wassermann, but with no fundus changes and normal fields for form and colors. Salvarsan was advised. The other, a man forty-eight years of age, with Argyll-Robertson pupils, slightly ataxic, loss of patellar reflexes and pallor of both optic nerve heads, somewhat accentuated by opaque nerve fibres, 20/30 vision in both eyes with astigmatic correction and slight contraction of color fields. Salvarsan was not advised.

My experience with the oculo-pupillary symptoms of general paresis is confined to two cases, both in the incipient stage. One had unequal, immobile, moderately dilated pupils and the other had normal pupils in size and reaction. After an intravenous injection there was no improvement and both patients are now in institutions with marked dementia and anisocoria. Dold* at Rivercrest Sanitarium has seen two similar cases and Trowbridge⁵ reports eight cases where the subcutaneous injection had no effect. Flemming⁶ observed pupillary changes following the injection in ten syphilitic patients with previously normal pupils. This probably would have occurred without salvarsan, but its advent was no doubt hastened.

It is noteworthy that anisocoria is found chiefly in parasyphilitic forms, but that may be negligence on the part of the examiner as few of the cases with secondary lesions have iritis and the majority, therefore, would not come under the observation of ophthalmologists. Hence, pupillary disturbances may occur at a much earlier stage of the disease. Wechselman⁷ cites cases where the rigidity of the pupils in tabes dorsalis disappeared under salvarsan treatment.

The consensus of opinion is that salvarsan is wonderfully beneficial in syphilitic iritis in both the secondary and tertiary manifestations, and iritis papulosa yields like magic to its action. In one of three cases of iritis due to tertiary lues, where the posterior synechiæ resisted the repeated instillations of a 3 per cent. solution of atropine, after one intravenous injection of 0.6 gm. the iris dilated *ad maximum*. In another, where the iritis was complicated by a superficial keratitis, forty-eight hours after the injection a small ulcer appeared in the centre of the cornea of the other eye. All of these cases made rapid recoveries and in only one was it necessary to repeat the injection. My careful observation has never disclosed any signs of old iritis in cases of tabes dorsalis or paralytic dementia.

Routine examination of the fundus in syphilitic cases, which have now become the rule, reveals

the fact that mild degrees of optic neuritis are common in syphilis, even without salvarsan, and therefore the neuro-recidives are due to syphilis and not to salvarsan.

Excellent results in neuro-retinitis have been reported by Igersheimer³ and a remarkable cure in sixteen days is cited by Fox and Trimble.⁴ Stuelp⁸ in his tabulated report says 81 per cent. of the cases of choked disk and neuro-retinitis were cured and 63 per cent. of the cases where the syphilitic involvement was of the uveal tract. At my clinics at Cornell University Medical College, we have had good results in iritis papulosa, parenchymatous keratitis and chorio-retinitis and it is a standing rule to refer all patients with syphilitic eye lesions—except those with simple atrophy of the optic nerve—to Dr. Edgerton in the G. U. department for intravenous injection of salvarsan. In none of the cases treated have we had any unpleasant symptoms.

Opinions differ greatly as to its efficacy in parenchymatous keratitis due to hereditary lues: and in unilateral disease it is only rarely possible to protect the healthy eye. Three cases treated by Vandergrift and seen by me at the Cornell Clinic are worthy of note. The ages of the patients were 15, 13 and 20. All had the typical physiognomy of hereditary lues, with Hutchison teeth and positive Wassermann. In two, the inflammatory symptoms were very marked with a distinct salmon patch in the upper margin of the cornea. All received three intra-muscular injections of 0.6 gm. The first two injections were given two weeks apart, the third after several months. The radiating lines due to the remains of the new formed vessels in the substantia propria are still present, but the vision is 20/70, 20/50 and 20/20 respectively. Good results are also reported by Cheney⁹ and Duhot¹⁰, while there was no restrictive effect in Neisser¹¹ and Uthoff's¹² cases.

Several authors have reported good results in paresis of the ocular muscles though a like number have found it ineffectual.

De Ridder¹³ cured a case of sympathetic ophthalmia in one month and in secondary glaucoma, occurring in syphilitis Morax¹⁴ found that the tension was lowered by the injection of salvarsan.

Two patients came to the clinic at the New York Eye and Ear Infirmary and said they were made practically blind by 606. On examination, one had papillitic atrophy of both optic nerves. The other had extensive chorio-retinitis with the vitreous filled with opacities. Both had had two and three injections of salvarsan respectively and the patient with chorio-retinitis had a very large scar on the left arm where the second intravenous injection had caused suppuration. After treating the latter patient with mixed treatment for several months, he improved very much and had 20/100 vision with prospects for further recovery. However, these conditions were not uncommon before the introduction of

* Personal communication.

salvarsan and in my opinion, permanent cure requires the combination with mixed treatment.

It is not fair to attribute the destructive and cicatricial changes to the effects of salvarsan, nor is it to be expected that any remedy will regenerate or reconstruct nerve tissue. Consequently it behooves us to use this agent early to prevent the ravages of the spirochætes.

Conclusions.

1. Salvarsan is a powerful symptomatic remedy for the treatment of luetic eye lesions.
2. It certainly merits attention, especially in combination with Hg. and iodine.
3. Its action is more rapid than that of Hg. but should not replace that valuable agent except in selected cases.
4. It should be given intravenously for quick action and for the comfort of the patient.
5. It should not be given in simple, spinal, non-inflammatory atrophy of the optic nerve.

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Discussion.

DR. J. A. FORDYCE: There is no question that salvarsan is a specific spirochætal poison. Its efficiency, however, appears to be in direct ratio to the age of the infection and its pronounced superiority over mercury, in my estimation, lies in the treatment of the early cases in which it is possible to abort the infection. It is in preventing the development of ocular and aural affections that a distinct gain and a decided advance over our former methods have been achieved. Since the adoption of an intensive and combined plan of treatment I have noted no relapses whatever in about 200 patients treated in the early stages of syphilis. This coincides with the experience of continental observers as Schreiber, Emery, Milian, Wechselmann and others who are using the drug on an extensive scale.

To appraise the curative properties of a remedy in any affection it seems to me we must appreciate the possibilities of the disease. In no other infection have we the opportunity of studying the effects of its causative agent as in lues

where its diversified action may be followed in the cutaneous manifestations. If such multiformity in the morbid process exists in the skin it takes no great leap of the imagination to visualize the same in the nervous system. The macular and papular eruptions undergo involution without disturbing the integrity of the tissue, while in the rupial syphilide, where the necrotising action of the spirochæta causes a destruction of tissue regression of the lesion takes place, but a scar remains. By drawing a parallelism between these cutaneous lesions and those occurring in the eye and ear it is easily conceivable how some will yield to antisppecific medication while in others of a destructive nature restitution can only take place with sequelæ.

In regard to a personal experience with salvarsan in the treatment of ocular affections, I have administered the drug in five cases of optic atrophy with temporary improvement in two only. It is believed by some writers that the degeneration progresses more rapidly after the use of salvarsan, but it does not necessarily follow that the development has been accelerated by the drug since its course is such a variable one, it being very rapid in some cases and slow in others. I have found very little evidence that it either cures or hastens the condition. I have, however, had very satisfactory results in several cases of acute optic neuritis, coming on in the early period of syphilis before treatment was begun or following the use of mercury. In one of these patients who suddenly developed choked disk after nine months of bichlorid injections the cure was almost spectacular. In several cases of choroiditis treated with salvarsan decided benefit was obtained, and in four of interstitial keratitis in hereditary syphilis, the existing active process cleared up, no change of course being observed where old cicatrices were present. In two of these patients a marked improvement in the hearing also took place. In the treatment of auditory affections with salvarsan my experience has been limited. Last Spring a patient was admitted to my service at the City Hospital with labyrinthine disease in the early secondary period of his infection without treatment. Under salvarsan temporary improvement took place, but he subsequently relapsed and is now totally deaf.

The questions of chief interest in the present issue are its toxicity for nerve tissue and the alleged increased frequency of recurrences affecting especially the eye and ear after its use.

The action of arsenic in producing a peripheral neuritis is very well known, but a review of the literature fails to disclose that it exerts a selective action on the cranial nerves. Coutela reminds that in Styria where the use of arsenic is abuse, ophthalmologists are singularly silent on the subject of ocular disturbances that might be attributed to that drug. Similarly in the epidemics of arsenical poisoning that occurred in Paris in 1828 from adulterated bread

and wine and in the North of England and midland counties in 1900 from beer, no mention is made of eye troubles, although detailed accounts are given of the other symptoms met with. Uthoff in his study of 100,000 patients with toxic optic neuritis, of whom 65,000 were examined by himself and his assistants, found only one case in which arsenic could be incriminated. This was a patient reported by Liebrecht said to have developed amblyopia with central scotoma after the prolonged ingestion of arsenical pills. Sulzer has also recorded six observations of a toxic optic neuritis after the use of arsenate of soda and potassium. Considering the extensive employment of arsenic in the form of cacodylate of soda, Fowler's solution and numerous other preparations the conspicuous absence of reports of accidents to the eye and ear show that the drug is practically innocuous as far as these organs are concerned. In the case of atoxyl it is believed by many ophthalmologists that the arsenic itself was not at fault but the aniline which, according to Berger, may produce similar results. In regard to salvarsan the fears, which the occurrence of neurorecidives created during the early period of its trial, have been entirely allayed by the further observation of the cases and the adoption of a more vigorous plan of treatment. It has been shown by laboratory experiments that salvarsan itself has no deleterious action on nerve tissue and this finds clinical corroboration in its employment in such diseases as framboesia, recurrent fever, malaria, etc.; where phenomena referable to the nervous system have never been met after such treatment. These facts, coupled with their complete regression under antispesific remedies have admittedly classed the majority of neuro-recurrences as true relapses of lues.

I have given more than one thousand intravenous injections and in not a single case have I noted the development of any auditory nerve disturbance and in only one instance a recurrence affecting the eye. This took place in a patient in the early secondary stage in whom a unilateral optic neuritis developed six weeks after a subcutaneous injection of the Wechsellmann suspension. This was subsequently shown to be a true syphilitic relapse.

There is a lack of appreciation among general practitioners that the early onset of nervous manifestations is part of the disease syndrome and has led to a tendency to regard such involvement as either due to the remedies employed or precipitated by them. As Saenger aptly remarked nerve manifestations in the secondary period of lues are being re-discovered through the attention drawn to them by treatment. With the diffusion of the spirochæta through the blood stream there is no logical reason why the meninges and other portions of the nervous system should not be involved during the florid stage and the probabilities are that in every case with a generalized cutaneous eruption the men-

inges are likewise implicated as manifested by headache, parasthesias, etc. Ravaut, Jeanselme, Crouzon and others have shown by lumbar puncture practised several weeks after the appearance of the chancre that marked lymphocytosis may exist without symptoms referable to the cerebro-spinal axis. In many of these cases as with the skin eruption the condition is only transient and yields readily to treatment.

Referring to statistics before the salvarsan era we find that Cestan reported cranial nerve involvement 14 days after the development of the initial lesion, Brauer five weeks, and Willbrand and Saenger twelve weeks after. Willbrand and Staetin give the frequency of optic neuritis as 20 per 100; Schnabel and Schenke 25-35 per 100, all in the early months. Krückman found optic neuritis 19 times in 600 patients, all within the first ten months, and Dufour claims that the early manifestations are more frequent than the late. Of the oculo-motor troubles Alexander, De Graef and Sauveneau give syphilis as the cause in 58 per 100 and Fournier in 75 per 100 cases. According to West 5 per cent. of individuals infected with syphilis suffer from labyrinthine disease between the fifth and twelfth months. Pollitzer's figures are 7-48 per cent. Meyer collected 65 cases of auditory nerve involvement and found that 20 per cent. occurred from three to ten weeks after the appearance of the primary lesion.

In Benario's analysis of 185 cases of neuro-recurrences after salvarsan 11 occurred in the primary, 34 in the primary and secondary, and 140 in the secondary stage of the disease, which is in chronological accord with their usual development. The great majority according to our present knowledge had had insufficient treatment and a renewal with few exceptions brought about *restitutio ad integrum*. In the cases which progressed to total blindness or deafness the following possibilities present themselves: (1) faulty technique as at the time these accidents were most frequent the importance of freshly distilled water in making up the solution was not appreciated and Yakimouf has since shown that salvarsan may be rendered toxic by the addition of bacterial products; (2) that treatment was not pushed energetically enough; (3) unusual severity of the pathological process where in spite of therapy irreparable damage occurs, analogous conditions occurring in the skin have previously been referred to. It is possible that in such cases we are dealing with a different strain of spirochæta; (4) the presence of additional factors as the abuse of alcohol or tobacco or a toxic neuritis of other origin. To illustrate I had under treatment with salvarsan a patient with an optic atrophy. The man worked with methyl alcohol, and although he denied lues he gave a positive reaction. In the presence of the well known action of the fumes of this agent on the optic nerve such poisoning could not be eliminated as the causative factor. The remedy had

no effect on his condition. In another instance about five months after salvarsan treatment one of my patients complained of failing vision. An examination showed that he was suffering from a tobacco amblyopia and that the trouble was entirely independent both of his specific process and treatment.

As the greater number of neuro-recurrences reported took place from one to several months after treatment I cite the following cases published by Sicard, Bizard and Gutman because the date of their appearance lay so much nearer to that of injection:

1. Patient with chancre in Feb., '11, developed secondaries April 11. On April 15th, and May 6th 0.4 and 0.5 gm. intravenously. On the day after the latter injection patient complained of buzzing in the ears, headache and vertigo; five or six days after he was stricken with multiple paralyzes involving the right auditory, left facial and right oculo-motor; also a double optic neuritis and bilateral pupillary immobility; Wassermann positive; lymphocytosis very abundant. Under small doses of salvarsan, mercury and potassium iodide complete cure took place with the exception of the ciliary paralysis.

2. Patient in the secondary stage was treated on August 29th; that evening he suffered from vertigo and chills. On September 8th another injection was given and on the following day right sided deafness and facial and oculo-motor paralysis were noted. Complete regression under small doses of salvarsan and mercury.

3. Patient in the fifth month of infection. Treated with 0.4 and ten days later 0.5 gm. Two days after the second injection headache, buzzing and vertigo, with the development of facial and oculo-motor paralysis. Also cure under further treatment.

The reporters attempt to explain these phenomena by the following theories: (1) that the spirochætae are driven from the muco-cutaneous tissue to the nerves; (2) a combination of locus minoris resistentiæ and slight toxic action of the drug; and (3) the action of endotoxins. In view of the fact that so many of these cases have a high lymphocyte count of the cerebro-spinal fluid it would seem to me that a meningitis would more readily explain the development of the multiple pareses. As to their appearance during treatment I have noted similar clinical pictures while patients were under intensive mercurial treatment. In one case where mercury was being administered to the point of toleration for an iritis of one eye the same condition developed in the other. Knowing as we do the effects of the disease on the meninges and cranial nerves it is far more rational to ascribe the various paralyzes which appear in the early stages of syphilis to the effects of the infection itself rather than to the drug.

DR. J. E. SHEPPARD: I would like to briefly report a recent case because it presents a problem

the answer to which I do not know, and would much appreciate it if some light might be thrown upon it in the closing of the discussion.

The patient was a man of about 40 who contracted syphilis between 5 and 6 months ago. His physician, so soon as the diagnosis was confirmed by the appearance of secondary lesions, gave a salvarsan injection, followed by a second injection after a short interval. Since which time he has been on antisyphilitic treatment. About 3 months after the second salvarsan injection, and about 10 days before I saw him, he began to be troubled with tinnitus and deafness, and moderate vertigo. The deafness was rapidly increasing, involved the right ear more than the left, and proved, as a result of tuning fork tests, to be distinctly of labyrinthine origin. In addition, he had a good sized tumor just above the right vocal cord, which our phonation doubled over in such a way as to obscure from view both vocal cords. This was the cause of much hoarseness, and was to my mind in all probability syphilitic in origin.

In reporting to the physician I asked that his antisyphilitic treatment be pushed with greater vigor, and that Pilocarpin be pushed to the production of its physiological manifestations.

Now, the question I would like to ask is, should the man have at the present time another salvarsan injection, or should we depend on mercury and iodide of potash? I might add in closing that I saw the man 2 days ago and found the deafness materially better, and the laryngeal tumor distinctly smaller, after 10 days of more vigorous medication since the time of his first visit.

DR. A. E. DAVIS: I am pleased to have heard Dr. Reese's most excellent paper on the "Effects of Salvarsan on the Eye." My own experience coincides very closely with that of Dr. Reese. So far, in my experience I have seen no evil effects following the use of salvarsan. In one case of optic atrophy with choroidal changes, with positive Wassermann, in which methyl alcohol poisoning also figures as a factor in producing the atrophy, intra-muscular injections of salvarsan were given, about 6-10 gm. at each dose. Following the first injection the vision was somewhat improved, but after the second injection, some weeks after the first injection, the vision (which was fingers at a few feet in the right eye and 20-200 in left) was considerably reduced. Later the patient underwent an intensive mercurial inunction treatment. With it all his vision failed (fingers 1 ft. right eye, and about 4-200 in the left, when last seen, one year after coming under observation). In my opinion the atrophy in this case was due to syphilis and methyl alcohol and not to the treatment of salvarsan. In cases of simple optic atrophy even, salvarsan can be given with safety, provided it is not administered in too large doses—not larger than 3-10 to 4-10 gm. The dose may be repeated two, three or four times.

If salvarsan is given in moderate size doses, therefore, 3-10 to 4-10 gm., intravenously, and repeated at not too frequent intervals, it may be administered with entire safety so far as the effect on the eye is concerned. Furthermore, it is not necessary to have the eyes so carefully examined, as was once thought imperative in reference to the condition of the optic nerve before giving remedy. If the patient's general condition permits of the treatment, the condition of the eye, so far as determining the feasibility of the treatment, may be left out of consideration.

DR. DESCHWEINITZ gave his experience with salvarsan in the treatment of syphilitic interstitial keratitis and the very favorable results which had followed its use, always employed in repeated doses and mercury and iodide during the intervals. He referred to the experiments which have been performed on animals with salvarsan and the disadvantages in the use of cats in these experiments, because their tissues naturally may show flabby changes. He quoted his experiences in the untoward results in the salvarsan, but thought the drug was often blamed when technic and imprudent dosage were really at fault.

DR. A. J. BEDELL: I have had experience with twenty-six patients covering cases of initial lesion of the eyelid, iritis, interstitial keratitis, neuroretinitis and one case of bilateral eighth nerve paralysis six weeks after an injection of salvarsan. A second injection cleared the eighth nerve lesion.

My results in interstitial keratitis have been somewhat different from those of Dr. Weeks. The cases are divisible into two classes, those seen early in the disease which respond very promptly, one cornea clearing in six days and those in the so-called sclerosing stage which do not respond as favorably. In some instances no improvement in the opacity follows.

DR. ARNOLD KNAPP spoke of the optic neuritis following salvarsan. At the present time I have a case who two months ago had an injection of salvarsan. For the past ten days his vision has been failing and he now shows a bilateral optic neuritis.

He also gave as an example of a neural recurrence, the history of a young man who had received as only treatment a single injection of salvarsan shortly after the primary infection. About three months later the sight in one eye failed and an intense optic neuritis with exudation along the retinal vessels was found present. The condition cleared up in two months after thorough mercurial treatment. Though moderate optic neuritis is not an unusual accompaniment of iritis in the secondary stage, the speaker has never seen so intense an optic neuritis at so early a period of the infection. The treatment with salvarsan probably brought this condition about, though there can be no doubt that the optic neuritis was a manifestation of syphilis as it cleared up promptly with mercurial treatment.

THE SIGNIFICANCE OF A CONTINUOUS GASTRIC JUICE IN THE FASTING STOMACH.*

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BY chronic fasting hypersecretion is meant the continuous presence of a pure gastric juice in the fasting stomach, after the stomach has emptied itself of all food remains gross or microscopic.

This is not to be confused with periodic hypersecretion, so often found in patients suffering from migraine, and in certain diseases of the central nervous system, or alimentary hypersecretion, which is present after the ingestion of food.

Chronic continuous hypersecretion has been variously regarded as being due to impairment of gastric motility and to the presence of a gastric neurosis, more recently organic lesions of the gastro-intestinal tract have been held responsible as pathogenetic factors.

Fenwick states that in 88 per cent. of all cases of chronic hypersecretion, a demonstrable lesion of the gastro-intestinal tract was found; he adds that his attention was called by Dr. William Mayo to those cases which seemed to require a gastro-jejunoscopy, and in whom, on exploration, a latent disease of the appendix was found. In his opinion, the remaining 12 per cent. would be explained by lesions of that organ.

Oettinger says that among 100 in whom a pure hypersecretion was found, 72 were suffering from gastric or duodenal ulcer (*Archives de l'Appareil Digestif*, 1910), while Storck emphasizes the necessity of viewing every patient as an incipient case of gastric ectasia; he states very emphatically that although the intermittent type of hypersecretion is at times due to a nervous affection, the chronic type never is, but is always the expression of an organic lesion.

If such is the case, we have a finding of great diagnostic importance, in the differentiation of the functional from the organic disturbances.

From over 2,000 tests made, on the fasting stomach and after a test meal, I have drawn the following conclusions:

- (1) That a normal stomach is empty 5½ to 6½ hours after an ordinary meal.
- (2) That any quantity of gastric juice, found after that time, must be considered abnormal.
- (3) That quantities of pure gastric juice, amounting to 30 cc. and over, should be regarded as constituting a hypersecretion.
- (4) Cases presenting gross or microscopic food remains, sarcinæ or bacilli, after a period of ten hours, do not belong to this class of cases, but are to be regarded as suggestive of a mechanical interference of the gastric motility, due

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to some obstructive lesion of the pylorus or duodenum.

The gastric juice was of a clear straw color, contained no food remains either gross or microscopic, and the chemical reaction for starch was negative.

In reviewing 1,500 cases of gastro-intestinal disorders, I found a fasting hypersecretion to be present in 57 cases. They were as follows:

Carcinoma of the rectum, 1 case.

Carcinoma of the lesser curvature of the stomach, 1 case.

Ulcer, gastric or duodenal, 7 cases out of a total of 9.

Chronic appendicitis, 20 out of a total of 33 cases.

Constipation (probably due to adhesions), 4 cases.

Gastroptosis, 4 cases.

Cholelithiasis, 5 cases out of a total of 11 cases.

Adhesions, involving the sigmoid, 1 case.

Chronic prostatitis, 2 cases.

Chronic salpingitis, 1 case.

Of these cases 37, or 64 per cent., gave no demonstrable evidence of gastric atony or dilatation.

In all instances the examination was repeated over periods varying from five days to several months.

The amount of the hypersecretion varied from 30 to 190 cc., with a total acidity from 70 to 124.

The occurrence of a chronic hypersecretion was first pointed out by Reichman who, in 1882, reported a case of continuous secretion of gastric juice of high acidity in the fasting stomach, a condition which he considered to be a distinct clinical entity of nervous origin and rare occurrence. Since then the condition has been taken up by many observers with varying conclusions, some considering it as being due to a faulty motility, and others to a pure secretory neurosis.

In considering the relationship of a chronic hypersecretion to a deficient motility, I found simple motor insufficiency in 261 of my cases, over 60 per cent. of these cases being complicated by a gastroptosis, the lower curvature of the stomach being from 2 to 5 inches below the umbilicus.

Although a very considerable number of these patients were profoundly neurotic, yet in 89 per cent., after an average fast of 9 to 10 hours, the stomach was either empty, or contained from 10 to 20 cc. of fluid, consisting principally of swallowed saliva, and in some instances a trace of regurgitated bile. There was an absence of free HCl, with a total acidity of 30 or under.

Accordingly, in chronic hypersecretion it would seem that there must be some other causative factor than a primary neurosis or motor insufficiency.

The existence of a motor disturbance, in many cases, is a well-established fact, but I doubt if such a motor disturbance is the sole etiological

reason. I believe there is some further exciting factor which must be held responsible for the impaired motility as well as the hypersecretion. I have never been able to satisfy myself that a chronic hypersecretion is due purely to a nervous irritability of the gastric glands, although there are cases in which it is practically impossible to discover any other explanation for it. This is not conclusive proof, however, of the absence of some other underlying organic cause.

In a detailed analysis of my hypersecretion cases, I found that in the five cases of cholelithiasis with hypersecretion, the operation showed in four cases the presence of adhesions involving the pylorus or duodenum. In the fifth case, a single large calculus was found in an enormously distended gall bladder, which in all probability was in contact with the duodenum, at least in the upright position.

The appendix group divides itself, according to the duration of the symptoms, into two classes. In the first class, the average time was a little over two years. All of these cases, with the exception of three, presented a chronic hypersecretion. In the second class, in which there were sixteen cases, the average duration of the illness was approximately five years. Only three of these showed a hypersecretion, and in a large proportion the test breakfast revealed a sub-acidity or an acidity. The secretions would therefore seem to have been at first stimulated and subsequently diminished.

Among the four cases of gastroptosis associated with continuous hypersecretion, one passed from my care before sufficient time had elapsed to make any conclusive observations. The remaining three patients were cured, as regards the hypersecretion, after a supporting belt had been applied, together with the institution of a suitable regime. In two of these cases, an X-ray examination was made, and the stomach was found to be of the draintrap variety, the pylorus and first portion of the duodenum being held well in position. It is possible that the tension on the duodenum might explain the hypersecretion, as this was present in no other of the simple atony and gastroptosis series.

That a functional constipation *per se* can cause a hypersecretion of gastric juice, has not been my experience. In the four cases of constipation in which hypersecretion was present, the impression was conveyed by the history and physical examination that the condition was rather an obstipation due to adhesions than a constipation; but owing to lack of opportunity I was unable to follow them to any definite conclusion. However, in one case of obstipation due to adhesions, involving the sigmoid, a well pronounced continuous secretion was found. The fasting stomach, in three examinations extending over a period of five weeks, contained from 40 to 70 cc. of pure gastric juice.

It was impossible for me to make a diagnosis

in 11 cases, but from the history and physical examination I am inclined to believe that there existed some definite lesion in the gastro-intestinal tract. Some of these patients improved under symptomatic treatment.

Whether or not a chronic inflammatory or reflex irritative condition outside of the gastro-intestinal tract is capable of producing a continuous hypersecretion of gastric juice, I am unable to say from any extensive personal experience.

The fasting stomach was examined by me in nine cases of chronic prostatitis, with reflex gastric symptoms. Only two of these were associated with any hypersecretion. The gastric symptoms were apparently relieved after treatment had been directed to the prostate.

During the past year, five cases of eye strain, giving rise to reflex gastric disturbances, have come under my observation. The fasting stomach in all of these cases was empty, the test breakfast showing only a moderate hyperacidity and atony.

Also, in one case of Graves' disease, there was no hypersecretion.

I wish to emphasize the advisability of a very guarded diagnosis of functional lesion, or of a purely nervous glandular irritability, in the presence of a continuous fasting hypersecretion, on the basis of the following observation:

G. R., male, 26 years old. The family and previous history were negative. He was practically a total abstainer from alcohol, and used tobacco only moderately. His present trouble dates back some six years to his senior year in college. At that time the bowels gradually became constipated, and he began to suffer from loss of sleep and appetite. No other definite symptoms could be elicited, save that he was getting more and more nervous and depressed, and he felt so generally depleted that he was unable to attend to his work. He had consulted several physicians, who regarded his condition as due to neurasthenia. He first came under my care four years ago, and at that time presented all the hallmarks of a pronounced neurasthenic. He suffered from morbid fears and had an endless number of varying complaints. Repeated physical examination always proved negative. Nothing was shown by an X-ray examination. Finally an exploratory laparotomy was proposed and performed by Dr. Clarence McWilliams, of New York. On opening the abdomen, he found a long and markedly thickened appendix, containing about one-half a dram of pus. The patient made an uninterrupted recovery. The bowels are now moving daily, and the neurasthenic element is rapidly clearing up. At no time had there been any local signs, but if one can judge from the character of the appendix, the inflammatory process must have been of long duration.

If this comparatively small amount of clinical material is any criterion, I believe the following conclusions to be in order:

(1) Chronic continuous hypersecretion in the fasting stomach is a symptom and not a disease.

(2) The condition is due to some definite lesion of the gastro-intestinal tract, and is not dependent on a nervous irritability of the gastric glands or the motor function of the stomach.

Whether or not this continuous secretion of gastric juice is due to a reflex nervous stimulation of the stomach glands, or to the presence of a gastric "secretion," I am unable to say.

To my great regret, I have been able to carry out systematic post-operative observations in only a few instances, but in such cases as I have been able to follow, judging from their improved condition and the relief from their symptoms, it would seem safe to assume that the normal condition of the stomach had been restored.

MODERN PHYSICAL TREATMENT OF ARTERIAL HYPERTENSION.*

By EDWARD C. TITUS, M.D.,

NEW YORK.

OWING to the short time allotted to me it will be impossible to present more than a sketch of some of the chief physical methods entering into the treatment of arterial hypertension.

Moreover, when it is considered that this condition is due to so large a variety of causes, it will be seen how hopeless would be the task to discuss fully this subject in a single paper. For this reason I shall refrain from citations from the very extensive and constantly growing literature on this subject and confine myself to a description of those physical measures which my own observations have shown me to be most successful. This is not done in a spirit of egotism, for I am sure that many valuable ideas will be brought out by the distinguished gentlemen who are to participate in the discussion.

If the space devoted to the discussion of high frequency currents in the treatment of arterial hypertension appears to be inordinately large, it is because the importance of such other physical agents, as rest, exercise, hydrotherapy and massage, is so well understood and appreciated, the value of electricity has been but recently recognized and is still doubted by many clinicians.

Given a case of arterial hypertension, it need hardly be said that our first step must be to determine the cause by the careful and discriminating use of every modern method of diagnosis. The fact that hypertension is frequently associated with arteriosclerosis has often led to errors in diagnosis in cases in which other conditions were responsible for the increased blood pressure.

It is hardly necessary to point out that hyper-

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tension within certain limits may be a compensatory phenomenon, as in renal, hepatic and cardiac diseases, and this should be carefully considered before any plan of treatment is instituted. In other words, the physician should never rest content with the diagnosis of arteriosclerosis, but interrogate every organ of the body, however remote, for a primary contributory cause of the hypertension. Thus, for instance, in women in middle life the presence of pelvic disease may give rise to persistent high blood pressure which promptly vanishes after appropriate treatment, and the same observation has been made repeatedly by me in men suffering from enlarged and irritable prostate.

Under the head of physical agents in the treatment of hypertension, I will proceed to discuss the influence of diet, rest, exercise, baths, and the high frequency electrical currents.

Diet.—The dietary regulations in cases of arterial hypertension must be strictly individualized in accordance with the causative factors. Particular attention must be paid to the condition of the gastro-intestinal tract, the liver and the kidneys. The presence of dilated stomach, or intestinal putrefactive processes and auto-intoxication will naturally demand the exclusion from the diet of any articles of food or drink that are liable to give rise to digestive disturbances.

The frequent existence of renal disease in these cases necessitates lightening the work of the kidneys as much as possible by reducing the amount of proteid and purin bases in the food, particularly, as it has been shown by Chittenden, and others, that a material reduction can be made without impairing the general nutrition.

To advise any exclusive regime, such as milk, buttermilk, or a vegetable diet, seems to me quite irrational. If we have to deal with an intelligent patient, we can learn much as to his dietary idiosyncracies by judicious questioning and govern ourselves accordingly. As regards the prohibition of alcohol, tobacco, tea, and coffee, it is my opinion that the baneful influence attributed to them by some authors has been somewhat exaggerated. The condition of the heart, the degree of hypertension and the extent of addiction in the individual case must be considered, though probably in most instances it will be advisable to interdict them.

There is, however, a considerable number of patients to whom a glass of whiskey and water with the chief meal, a light cigar or two, or a cup of weak tea or coffee will prove a great solace without interfering to any material extent with the treatment of their hypertension.

Rest.—As regards the question of rest, this will depend upon the degree of hypertension, the extent to which it responds to treatment, the condition of the circulatory apparatus, and last, but not least, upon the individuality of the case. It goes without saying that the patient should avoid any prolonged sustained violent physical or men-

tal strain and that he should obtain sufficient rest at night. On the other hand, to advise an active business man to change or cease his occupation will often awaken a suspicion of the seriousness of his condition and so disturb his mind as to react unfavorably upon his general state.

Exercise.—Many of the subjects of hypertension are men and women who are overfed and underexercised. In advising exercise we must take this fact into consideration and counsel great moderation at the beginning of treatment. At first short walks, avoiding fatigue and gradually lengthened in duration, followed by light muscular resistance exercises, as the Nauheim movements, are beneficial. It is always best to gauge the amount of exercise by its effect upon the blood pressure. Later the patient may be allowed to indulge in sports which do not tax the heart and blood vessels, such as golf, horseback riding, rowing, etc., but in great moderation.

These same instructions apply equally to persons of spare development, and it will be found that while the corpulent subject will lose in weight, the lean one will actually gain in flesh as well as strength.

Hydrotherapy.—In regard to hydrotherapy the same statement as to strict individualization as in the case of diet is applicable. The general condition of the patient and the causative factors of the high pressure demand careful consideration. It stands to reason that in persons suffering from cardiac disease with failing compensation, the hydrotherapeutic measures employed should be different in kind and degree than for those in whom other organs are chiefly at fault.

In a general way it may be stated that cold baths, except as an auxiliary, are unsuitable in these cases because they often defeat the object in view, namely, the dilatation of the cutaneous vessels. While it is true that the indirect effect of a cold bath in the ordinary healthy individual is to cause such dilatation during the period of reaction, it must be remembered that many subjects of hypertension do not react sufficiently and consequently are not benefited.

It is recommended by some authorities that prolonged warm immersion baths be given in the morning followed by a tepid and cooling shower and a thorough rubdown. This seems to me a rational procedure, since it serves to promote elimination by way of the skin, besides its beneficial effects upon the circulation; there is no objection, however, to this procedure being carried out at night if the patient prefers. A Russian vapor bath two or three times a week is often desirable as a supplementary measure, and is to be preferred to the Turkish bath because the effect is more prompt and decided.

I do not generally favor the house cabinet baths for this purpose on account of their limited efficacy and the absence of trained attendants. Superior in my judgment to any of the above

measures in efficiency is a properly constructed electric light bath cabinet. I use the term "properly constructed" advisedly, as it has been my experience that most of the cabinets made in this country are faulty in the matter of shape, size, arrangement of lights, ventilation and comfort of the patient. From a report of the Committee on Phototherapy made by the writer to the American Electro-therapeutic Association, September, 1911, and published in the *Journal of Advanced Therapeutics*, February, 1912, I quote as follows:

"An electric light bath cabinet should be constructed according to the following plan: The cabinet should be octagonal in shape; the lining should be of white blotter surface; the source of light should come from 100 40-watt tungsten lamps, conveniently arranged, so that they will be under control from within by properly placed switches, one-half or full number of lights to be employed, as desired. The cabinet should be open at the top, not entirely, but partly so, and it should have an air vent three inches in diameter in the centre of the floor, over which is placed a low stool 18 inches high, upon which the subject is seated. (It has been found that a ventilated room is much more quickly and evenly heated artificially than one that is closed or sealed). The further advantages of this construction are the volume of light with a minimum amount of heat produced in the cabinet, that the emanations of noxious gases and odors from the human body are quickly carried off, that the degree of cutaneous hyperemia and diaphoresis is much more intense, and that the usual depression and other unpleasant symptoms are entirely obviated, as compared with the older form of closed cabinet."

With the Nauheim baths I have had but limited experience. Their efficiency, however, is so well known to all of you as to require no extended comment. Yet it seems to me that to obtain the best results from these baths, the patient should take them at Nauheim under the supervision of men who have made a specialty of this method of treatment.

Massage.—Massage in its various forms is particularly indicated in patients who are unwilling to take active exercise or unable to do so until their hypertension has been brought under control.

I must confess that I have rarely found it necessary to recommend a course of massage except in the case of debilitated patients, in conjunction with physical rest.

Electricity.—I have reserved the discussion of electricity in the treatment of hypertension for the last part of this paper in order to speak more fully of this agent, which in my opinion is still far from being appreciated at its full value. I am aware there is still a general prejudice based on a misunderstanding as to the mode of action and utility of the different electrical modalities.

To many medical men the entire field of electricity is compassed in the use of the galvanic and faradic currents, as if there was nothing else in what has grown to be the modern science of electrotherapy.

A proper electrical equipment is seldom to be found in the office of the average practitioner even at the present day, and it may justly be asked whether the men who are so prone to criticise this valuable agent have taken the trouble to investigate the physiological and therapeutic effects of the different currents and familiarized themselves sufficiently with the technic of modern apparatus to justify their skepticism. Yet it seems to me that the extensive literature during recent years on the value of electricity in various diseases is evidence that the profession is at last awakening to its possibilities; therefore it requires no apology on my part to emphasize the importance of the high frequency currents in the treatment of hypertension.

As no doubt you are aware, there are several kinds of high frequency currents, but the one referred to here is the autocondensation of D'Arsonval. Briefly speaking, this current may be obtained from a highspeed static machine of sufficient capacity, a Ruhmkorff coil of proper construction, and the more modern transformer apparatus, in connection with a resonator.

These instruments should be provided with a milliamperemeter of reliable make, and the patient should rest on an autocondensation couch properly adjusted to the capacity of the machine—a current ranging from 5 to 8 hundred milliamperes is usually employed for from 12 to 20 minutes at each sitting. The applications are at first made daily until a considerable reduction in the blood pressure, as shown by the sphygmometer, is obtained, then on alternate days or at sufficient intervals to maintain the effect. Now as to the modus operandi of this method, I can best illustrate this by taking an average case.

A patient of middle age presents himself with a blood pressure of 225 mm. in association with beginning arteriosclerosis. After an application his pressure is found to be reduced from 10 to 40 mm.; the skin is moist and bathed in profuse warm perspiration, while the body temperature is increased from one-half to $2\frac{1}{2}$ degrees. Coincidentally there is a feeling of restfulness and relaxation and relief of discomfort due to the hypertension. *What does this signify?*

Now let us see how this is accomplished. Not one, but a number of factors are concerned in bringing this about.

In the first place, the action of the high frequency currents, employed in this manner, is to dilate the peripheral vessels by relaxing vascular spasm. This will act beneficially by relieving engorgement of the internal organs, as evidenced by profuse diaphoresis and diuresis with increase of solids in the urine.

In the second place, the current exerts a direct influence upon the cellular elements, which may

be expressed as a thermic effect. This manifests itself by an increase of oxidation processes in consequence of which the elimination of toxic materials is augmented.

In the third place, cellular metabolism is promoted, as is shown by the improved nutrition and the gain in physical and mental strength.

One point of great importance in connection with this method is that it is unaccompanied by any depressing action upon the heart or respiration. This is strikingly shown by the fact that after D'Arsonvalization the pulse becomes softer and more regular, and there is an absence of any evidence of faintness or cardiac distress. It is therefore justifiable to assume that the effect is exerted upon the musculature of the arteries and not directly upon the heart.

As has already been suggested, D'Arsonvalization does not depend for its efficiency upon its influence on the vascular apparatus alone. Thus, for instance, in cases of marked arteriosclerosis in advanced life where it is impossible to affect the lumen of the vessels, the patient nevertheless experiences a change for the better, probably as a result of the influence of the current upon metabolism, and in promoting elimination of toxins which play so important a part in this condition.

But far more strongly than any theoretical deductions that I may be able to present, the results of clinical observation of many cases testify to the value of this method.

Let me urge you to give it a trial in those cases where other measures have proved more or less disappointing, and then note the difference.

You will find that when diet, drugs and exercise but moderately or temporarily affect hypertension, the addition to the treatment of the auto-condensation high frequency currents of D'Arsonval will often produce a further reduction or, at any rate, maintain the arterial pressure at a safe point with only infrequent applications.

There are but two provisos that I desire to make: the one is, familiarize yourself with the method before resorting to its use; the other, do not attempt to reduce hypertension in cases in which it is a compensatory phenomenon.

TOXIC DELIRIA: REPORT OF CASES.*

By N. A. PASHAYAN, M.D.,
SCHENECTADY, N. Y.

NO attempt will be made in this paper to discuss the relation of toxemia in general to the genesis of psychoses. The cases to be reported comprise some of a larger number observed during the past four years in the city of Schenectady and its vicinity and indirectly they throw some light upon the prevalence of such disorders that hardly ever reach the confines of state institutions. The most

familiar types of toxic delirium are produced by alcohol, morphine or cocaine and our knowledge in these fields has been greatly enhanced by the studies of Bothœffer and Wernicke. Deliria of other toxic agencies are essentially analogous to the alcoholic variety yet differ in certain particulars as will be pointed out later.

The first case to be related was an acute toxic delirium induced by "Somnos," which was introduced a few years ago as a safe and efficient hypnotic and eagerly seized upon by the profession at large. The patient, a woman, aged 38, married, has had one miscarriage and probably also an antecedent luetic infection. She was subject to attacks of intense pain in both arms every time she happened to immerse them in cold water. In disposition she was erratic, suspicious and apt to go to extremes in everything she attempted to do. She suffered with chronic insomnia which became intensified by the attacks of pain in the upper extremities. Upon the prescription of a physician she took "Somnos" as a hypnotic and continued doing so in ascending doses. In July, 1910, she was suffering with pain in the arms and took one pint of the preparation within twenty-four hours without, however, getting any sleep or relief. Presently a multitude of voices like a thunder storm came upon her. She could hear all the neighbors talking about her and see them watch her movements. She believed that the entire house was wired mysteriously in the twinkling of an eye and through these wires her thoughts were conveyed to distant parts. She could hear hundreds of voices and diverse languages through the telephone although she had not been near it. Her body was charged with electricity and would not allow her husband or the physician to touch her with fear of a resulting mortal shock. With these hallucinations she developed the fixed idea that the neighbors and one man in particular had wired the house out of jealousy and revenge and she was to be tortured and killed. Notwithstanding these vivid hallucinations and persecutory ideas she was cheerful and even at times hilarious. She seemed to derive a morbid pleasure out of this seemingly torturing situation. When left to herself she was abstracted and seemed preoccupied as if in a dream, but as soon as spoken to, she would respond, was familiar with the month, day and year, and able to give clear and accurate information about her past life as well as recent occurrences. She was alert and in discussing matters of business keen and discriminating as ever. At the end of three days all the imaginary voices subsided, the wiring was just as mysteriously removed. The allopsychic ideas lingered for a week or more and then disappeared. Recovery was complete and no relapses have occurred since.

Among the extensively used remedies salicylic acid and its congeners occupy a prominent place

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and deservedly so. In acute articular rheumatism and allied conditions their action is specific and often large doses are given for the control of the disease process. It is often difficult to decide in a case of complicating delirium if it is due to the specific virus and its attending pyrexia or the drug employed should bear the blame. We have seen cases, however, in which the cerebral symptoms were directly attributable to the chemical agent employed and vanished with its discontinuance. One illustration of this kind is as follows: A middle aged woman with no cardiac or renal disease, developed neuritis of the left arm without fever or other complication. The pain was intense for the relief of which the attending physician gave ten grains of aspirin every three hours for five or six consecutive doses. The following night the patient became confused, looked at her daughter in amazement as if she failed to recognize her for a moment. She would alternately laugh and cry and on closing her eyes would jump as if startled. She had been deaf in both ears for a number of years and it was with considerable difficulty that her attention could be secured. She volunteered the information that she saw cats and dogs dart through before her eyes and heard numerous voices. When left alone she would promptly become abstracted, mutter to herself and attempt to remove the local applications from her arm. Twelve hours after the aspirin was stopped the mental picture cleared up and has remained so since.

In a case of subacute articular rheumatism two drams of salicylate of soda given in divided doses in twenty-four hours were sufficient to produce a delirium marked with visual and auditory hallucinations, anxiety with motor agitation. Twenty hours after the last dose of the salicylates no vestige of cerebral symptoms were to be found.

Considering the universal use and the therapeutic utility of bromids there should be no surprise that now and again we meet with delirious states caused by this drug as the following history shows: A young woman, 28 years old, was subject to nocturnal epilepsy which did not incapacitate her from earning her livelihood in a factory. For a period of two months her physician gave bromids four times a day; the dose could not be ascertained. When seen three days after the onset of the delirium, she was confused, markedly somnolent, whining and crying a great deal. While awake she was restless, would attempt to move from one place into another, was ataxic and unable to walk without assistance. Her speech was thick, she had considerable difficulty in understanding simple questions and was distinctly paraphasic. She recognized the members of her family, knew that she was at home, but was uncertain as to time and recent occurrences. She complained of seeing strangers in the house and some men crawling under the bed and also heard noises that terrified her. At times

these hallucinations could be reproduced artificially. She expressed some allopsychic ideas against her father. There was an acneiform eruption on the face, the tongue was coated and breath offensive. About a week after the bromids were discontinued she was restored to her normal mentality.

Sporadic parotitis or mumps is by no means a rare affection, and as a rule runs a benign course. Two out of three cases seen developed certain well defined cerebral symptoms of brief duration and terminated in recovery. In both cases mumps made its appearance first, followed by orchitis and it was during convalescence that the delirium supervened. Mr. C., age 34, married, mail carrier, good habits. Personal history not important. A maternal uncle is said to have been feeble-minded. In April, 1908, he had an attack of parotitis with moderate fever. On the fifth day the right testicle became involved. Both glands were in the process of resolution, when twelve days after the onset of the original disease, suddenly at 4 P. M. he became confused, restless, talked foolishly, and urinated in the flower pots around the room. When seen for the first time he looked dazed, jumped out of bed, talked aloud with numerous purposeful gestures. He was elated and seemed to labor under considerable pressure. He said: "I am dead, a baby two years old knows more about it than I do. You can't understand it, that's the particular part of it. Now you know, now you don't; that's the particular part of it. You think I am talking foolish, that's the particular part of it, etc."

He was easily pacified and put to bed. Occasionally he would attempt to talk in the same strain, but was readily controlled. He was well oriented and could give an intelligent account of his life and had retained his grasp on things in general. As long as his attention was retained he was rational and no disturbance of the psychic processes could be made out. That night he slept with the aid of a hypnotic and the following morning was calm and composed and said in explanation: "I felt faint, a strange feeling came over me, I can't describe it. It seemed as if two opposite forces rushed into my head. I remember everything I said and did; knew how foolish it was, yet could not control myself." About four o'clock once more he became mildly excited but thirty-six hours after the inception of the mental symptoms he was well as usual and has followed his occupation ever since.

Two cases of protracted delirium at first thought seemed to belong to the infective-exhaustive group, but as the cardinal symptoms of the latter affection were wanting they are included here as being toxic in nature. Drugs as far as could be ascertained played no etiological rôle.

The first case, a woman, 27 years old, married, has been delicate and neurotic all her life. She was operated upon for pyosalpinx on October 24, 1911. There was a subsequent infection with

moderate fever. Two weeks later she was removed to her home where for a period of five weeks she was delirious with vivid hallucinations. The most marked features were anxiety and apprehension with the fixed delusion that a certain man was hiding in the room contiguous to hers, who would sneak around under her bed, was in league with the nurse and meant bodily harm. She could hear the floor squeaking and felt that the bed would be lifted up as if in an elevator into several flights and lowered again. She was conscious of a certain species of fish crawling all over her body, which she would pick with her fingers and cast them aside, still was unable to see them. She spoke of having her feet in the mouths of two large fish, as a therapeutic measure adopted by her physician. She saw objects moving in the room and a diffuse green light permeating the entire house. On two occasions she described some trips to the seashore and also having had a ride in an automobile. Several attempts were made to reproduce these hallucinations without success.

When left alone she was enveloped in these hallucinations but could be easily aroused, was constantly found well oriented as to time, place and person, did not mistake the identity of those about her nor any difficulty of comprehension could be made out. The only physical abnormalities found were emaciation, sluggish bowels and insomnia. Under treatment the delirium subsided and she made a complete recovery. In an interview on April 1, 1912, she was able to give a full account of her experiences and in a measure retrace some of the illusions that culminated into hallucinations.

The second case of delirium running a protracted course was seen in Mrs. D., aged 61, the mother of eleven children. She was operated on for gall stones in May, 1908. Following the operation and several months thereafter she became the prey of some fantastic and weird hallucinations. At first it was during the night that she could feel yards of rubber tubing come out of the wound, expand and then break off. Later huge masses of stone, nails, serpents and other animals would crawl out, grow into larger dimensions and break off from her body. As soon as she tried to touch them they would vanish and in vain she would search for them in the bed and the room. Gradually they began to torment her even day times. She could unmistakably feel those monstrosities sprouting out of her abdomen but was unable to palpate or see them. In her attempt to explain these hallucinations she would shift from one idea into another, but otherwise there was no mental defect to be made out and her attitude towards her relatives remained unchanged. Gradually the false sense perceptions became less vivid and vanished eventually. She has enjoyed good health mentally and physically for the past three years.

In conclusion it may not be out of place to make a general survey of toxic deliria and point

out some of the salient and diagnostic features. To begin with the mental symptoms are, as a rule, ushered in suddenly with no prodromata and are the result of some toxic agency. The predominating picture is one of confusion as if the patients were in a dream, out of which they can be transported into a rational state. There seems to be a mere lowering of consciousness, but not to the extent of causing serious clouding or disorientation. They sink to this lower level by the presence and the dominance of hallucinations that are unusually vivid yet easily held in abeyance as long as the patient's attention is retained by talking or other stimuli. The hallucinations seem to have a predilection in affecting the tactile sensibility, although the visual and auditory centers are often involved. In some cases it is possible to reproduce them artificially.

Delusional ideas play an unimportant rôle, they are usually changeable and fleeting and merely express the patient's efforts to interpret their morbid states. Furthermore, the emotional tone is variable but seldom runs parallel with the hallucinations or the delusional contents and seldom exhibit the depth and intensity as seen in other psychoses.

In all cases of toxic deliria observed there was retained some insight, they were partially cognizant of some abnormality in their condition and willing to co-operate.

Finally the prognosis has been invariably good when it was possible to remove the toxic agency with no tendency to recurrence.

A LARGE HEMATOTHORAX.

By J. FIELDING BLACK, M.D.,

WHITE PLAINS, N. Y.

AN Italian laborer, age 31, recently came under my care at the White Plains hospital.

Ten days previous to my seeing him, he had been stabbed in the back, between the 8th and 9th ribs on the left side, and about three inches from the dorsal spines. The wound was about an inch in length and penetrating.

There was profuse bleeding from the wound for three days, necessitating extensive packing of the wound, and tight bandaging of the chest, by the physician in charge.

When the patient came under my care, his temperature was 104, pulse 128, respirations 40.

There had been a chill the day before and some sweating. There was also great pain in the left chest and region of the heart during deep respiration.

Examination of the left chest revealed complete absence of breath and voice sounds.

There was flatness from apex to base, giving evidence of a chest full of fluid.

The heart sounds were considerably diminished, and apex beat displaced to the right. A hacking cough, but no bloody expectoration at any time. The wound was granulating, and external hemorrhage had ceased.

Aspiration withdrew a blackish fluid, evidently old blood.

Three inches of the 8th rib was resected, and on opening the pleural cavity there was a gush of old fluid blood, that resembled a small geyser, such was the pressure within the chest.

If all the fluid could have been collected I am sure there would have been a bucket full. From the dependent parts of the cavity, handfulls of fibrin were removed, but the most striking feature was the apparent absence of any lung tissue, almost as though the thorax had been devicerated.

The pressure of the fluid had jammed the lung into the costovertebral angle, till it was little larger than a man's clenched fist.

It was easy to place your hand against the back of the pericardium and palpate the heart to your own heart's content.

No shock followed the operation, and the wound was closed about a two-flanged soft rubber drainage tube.

The temperature varied between 98 and 100 for the following three weeks. At the end of this time he was out of bed, and the tubal drainage discontinued. In three weeks more the lung had apparently filled the chest cavity and breathing was normal.

It seems strange that an intercostal artery could bleed to such an extent and compress the lung to a fraction of its former size. There was no way of telling if the vena azygos minor had or had not been injured, but such is possible, as its course lay in front of the location of the stab wound. In that event, however, one would expect to find a retropleural dissecting hematoma, which was not the case. Nor do I believe a branch of the bronchial artery had been injured, for there was no evidence of lung trauma, and in any event the branches are very minute in that locality.

DUST FEVER.

By **FREDERICK J. BOWEN, M.D.,**

MT. MORRIS, N. Y.

AN industrial disease which I have several times encountered but have never seen described, is well known among grain threshers as "dust fever."

I have found on inquiry that the ailment occurs also among flax hatchelers. As it is

caused by the inhalation of dust in excessive quantities, it probably occurs in various occupations supplying this essential etiological factor. The only cases coming under my observation, however, have been among threshers, or farm laborers engaged in grain threshing.

Grain becomes musty when the curing process, during harvesting, is interrupted by rains; and the production of dust is thus greatly increased. This renders the work of threshing in the barn, as commonly done in the northern states, particularly disagreeable; and the laborers engaged, subject to the ailment. It is not improbable that certain elements in the dust possess toxic properties and that these, rather than the mere mechanical irritation of the particles, cause the trouble; but this is merely problematical.

Dust is mentioned, incidentally, by some writers as a cause of coryza; but the symptomatology of coryza is so mild, comparatively, that it apparently was never meant to include the subject of this article.

The sickness begins in the evening or during the night following the day's work in dust. The symptoms are severe; often alarming. There is a pronounced chill and usually vomiting. The face is flushed. Patient may be delirious and with a temperature as high as 104. There is marked congestion of the mucous membrane of the respiratory passages. The picture is not unlike that often presented at the onset of pneumonia in a robust subject.

The symptoms moderate during the second and third days. A copious exudation from the nasal and bronchial passages, eliminating microscopic quantities of dust.

CORRESPONDENCE.

WHY THE PRACTICE OF THE SPECIALTIES SHOULD BE CONTROLLED.

By **EMIL AMBERG, M.D.,**

DETROIT, MICH.

At the present time any person who chooses to call himself a specialist may do so. The only restriction lies in the character of the individual. This fact includes, it is true, a high tribute to the integrity of the specialist and, from the standpoint of individualism, this condition represents the highest type of development. From the standpoint of a well-regulated and well-governed community it represents anarchy. Anarchy, according to Webster, is "absence of government; the state of society where there is no supreme power; hence, a state of lawlessness or political disorder. . . ." It is scarcely necessary to be reminded of an almost anarchistic state of affairs in regard to the practice of medicine, which lies within our memory. Whether the regulations of the license to practice medicine in general are as good as they should be, or whether there is much opportunity for improvement, is a question familiar to all of us. We can say, however, that something is being done continually in this direction, and the progress within the last few years is commendable and encouraging. Gradually a number of physicians

have undertaken obligations distinctly different from the general duties of medical practice. They confine themselves to certain branches of medicine, excluding all others. This specialization involves special preparation and application to the special branch in medicine. We are confronted with the question, to what extent the supervision of the state is applied to the practice of the specialties. The answer is as simple as it is dumbfounding. It is evident that a state board of medical licensure, a body on which devolves the control of medical practice, must exercise this control not only in name but in fact. I do not know of a single instance in which such a responsible board has even asked for evidence of knowledge and fitness in regard to the practice of the specialties.

While these ideas may, and I hope will, be accepted generally, the question arises, Where shall all the specialists receive such training which should include hospital service? This might be given in the various medical centers, in special hospitals or in special departments of general hospitals, which should furnish the opportunity for such a special education. We have, of course, postgraduate schools which can aid in the instruction; especially is this done at present also in one of the foremost medical postgraduate schools, the Allgemeine Krankenhaus, in Vienna. Yet, only in exceptional cases, and by a long stay, can the whole instruction be received in such centers for postgraduate instruction. The main work should be done as assistant or interne in a hospital.

THE SPECIALIST'S LICENSE.

With all due respect to editorial exigencies, I feel called upon to enter a protest against the ill-considered, inchoate and inadequate essay in the May issue of the *NEW YORK STATE JOURNAL OF MEDICINE* entitled "Special License for the Specialist." The writer in question quotes from an article in a recent number of the *Journal of the American Medical Association*, the author of which had written in favor of state control of the practise of the specialties.

I knew nothing of the article quoted from the *Journal of the American Medical Association*, and have not read it since, contenting myself with abstracts from the article and the editorial comments thereon. After ages of torpidity, this and kindred topics relating to the esoteric aspects of medicine are coming into the heat of discussion, and, it is sincerely to be hoped that not only heat, but some light also will evolve therefrom.

There are and probably always have been many people in this unregenerate world of ours who believe that all the ills of society can be legislated out of existence; but one needs only to turn the pages of "dead laws" to realize how far short of its purpose legislation has fallen. A dead law is worse than no law, inasmuch as it inspires popular contempt for legal procedure in general. In this sense it is *not* better to have legislated and failed than never to have legislated at all.

Whatever is to be done, and however this whatever is to be done is beside the mark at the present moment, but certain it is that there is a crying need for defining in some comprehensible way what is meant by the words *specialist* and *specialism*. There are those who seem to hold the opinion that a specialist is a man who buys a set of new tools and an elaborate office equipment and strikes out for "experience." With this in mind, anybody is a specialist who chooses to say he is one, just as in former years anybody could be a doctor whose convictions lead him in that direction, without going through the formality of graduating from a medical school. This is obviously injurious to all concerned,—first to the self-styled specialist, second to the rank and file of other specialists, third to the profession as a whole, and last, but certainly not least, to the public.

The editorial writer in question says that: "If we are going to have state boards of examiners on all the specialties such a course would imply the right of the

specialist to announce himself as such. The ethics of the profession have (*sic*) always prohibited any announcement of a specialty. In New York a man cannot put 'Oculist' on his sign without incurring discipline." *O tempora! O mores!* Why in the name of common sense should a specialist be ashamed of the kind of work he is doing? Isn't it about time that we buried old fogy notions of this sort? Not only should a specialist "announce" himself, but his sign should bear the stamp of approval of the Academy of Medicine or County Society, affixed by proper authority after due presentation of credentials showing the candidate's fitness and special qualifications. Can anything be more stupid or silly than this sign question in the light of ethics? I think not. That the ethics of the profession exists less in fact than in thought is undeniable. The hackneyed use of this thoroughly respectable word in medical circles gives one a supreme sense of *ennui*. The man who is not afraid to do his thinking independently is in no special need of a tribunal to pass upon the morale of his acts. Who is responsible for the code of ethics? Obviously men who have reached the so-called "top of the profession," who are financially and socially free from those obligations which fetter the young man and frighten him into threadbare mediocrity, self-abnegation or absolute nonentity. It is not too much to say that every successful practitioner of medicine obeys no "code" of any particular kind, but relies upon his own conscience, good judgment, common sense, and upon the sacred precepts of the golden rule.

All half-baked or other underdone specialists should be exterminated. No physician has a right to that title unless he has been trained to avoid the pitfalls and dangers which may imperil the health and life of his patient. It is nothing short of a crime to turn a patient over to an uninstructed and ignorant novice and tell him to "go ahead and operate." Just so long as such a state of things exists, and unfortunately such a state does exist here and now, just so much worse it is for specialism and for the patient. Let every man have at least three years of varied training in general practise, let him devote all his time and energy to learning a specialty under a competent instructor for at least one year, then submit him to a test ("Regents," or Council of his Fellows), and we shall have specialists who are not an everlasting discredit to the profession.

IRVING WILSON VOORHEES.

PREVENTION OF BLINDNESS AGAIN.

May 22, 1912.

The Editor of the NEW YORK STATE MEDICAL JOURNAL.

SIR: An editorial in your May number commending the annual report of the Committee on Prevention of Blindness of the N. Y. Association for the Blind, leads me to ask for a little space in which to speak of a matter which seems to this committee to be of considerable importance,—a matter in which physicians, even more than midwives, are at fault.

While ophthalmia neonatorum exists, the only way to limit its disastrous consequences, as experience elsewhere has shown, is to have every case reported early to the Department of Health, which may then follow up the case and secure proper care and treatment for the patient.

The Social Service department of the Massachusetts Charitable Eye and Ear Infirmary in Boston recently analyzed 388 cases of ophthalmia neonatorum observed there within a period of 4 years and found that in 368 of these cases the birth had been attended by physicians. These were private in 272 cases, dispensary in 30, City in 3, and hospital in 63. About 10 cases a month were at that time reported to the Boston Board of Health, as the law required. After the conviction of several physicians for failure to report and neglect, in a few months the number of ophthalmia cases reported was greatly increased and as a nurse from the Board

of Health visited each patient, excellent results were obtained.

What are the present conditions in New York City? In the year 1911, there were reported to the City Department of Health 38 cases of ophthalmia neonatorum. Eleven of these reports were from institutions, 15 of the other patients having been attended at birth by physicians and 8 by midwives, no information being obtainable owing to removal of family in 4. These cases were followed up by the Department of Health. The printed reports of eye hospitals in New York City for 1911 show, however, that in 1911 124 cases of ophthalmia neonatorum were treated at these eye hospitals, while some 50 cases were treated at the Foundling Hospital, and the number treated at maternity hospitals, usually considerable, and elsewhere, is not known to me. At a fair estimate, about one case in six was reported to the Department of Health. Since August, 1911, 60 cases of ophthalmia neonatorum in New York City have been investigated by the committee on prevention of blindness. Thirteen of these patients were born in hospitals. Wrong addresses prevented our gaining information about 11. Of the remaining 36 cases the births were attended in 20 cases by physicians (in 33 by physicians with the hospital cases included), and in 16 by midwives. Four physicians and twelve midwives seem to have been guilty of gross neglect in the care of patients, and in three of the patients attended by physicians one eye was lost and in one patient attended by a midwife, the sight was affected.

The New York legal regulations in this matter are in brief as follows:

A New York State law requires physicians and midwives (except in the cities of New York, Buffalo, Albany and Yonkers, where there are local health boards) to fill out a card of notification of birth and mail it to the State Department of Health within 36 hours after birth. On this card one must state what was used as a preventive of ophthalmia neonatorum. The State Department of Health has made ophthalmia neonatorum a reportable disease.

The sanitary code of the New York City Department of Health requires the midwife to summon a physician, on the appearance of swelling and redness of the eyelids with a discharge of matter from the eyes. It requires the physician to report every case of suppurative conjunctivitis within 24 hours. It requires the physicians, officers or managers of every hospital and dispensary to report every case of suppurative conjunctivitis, with the name of the physician or midwife in attendance at the time of the onset of the disease. Any violation of the sanitary code is to be treated and punished as a misdemeanor and the offender shall also be liable to pay a penalty of fifty dollars.

We know that many physicians neglect to instill nitrate of silver into the eyes of the newborn, although the State of New York through the Departments of Health furnishes free to physicians and midwives convenient ampoules each containing enough 1 per cent. nitrate of silver for the eyes of one infant.

We know that many physicians and officers of hospitals neglect to report to the Department of Health their cases of ophthalmia neonatorum, as the law requires, thereby rendering themselves liable to a fine of \$50 for each violation.

We know that some physicians neglect to secure proper care for patients who have acquired ophthalmia neonatorum through the physician's negligence. The State is interested since it expends thousands of dollars annually in the institutional care of the blind victims of this neglect.

In Massachusetts they held the medical school responsible for the ignorance of physicians in these matters. If the medical school is negligent the medical press would seem to be the medium for the education of physicians in sanitary affairs.

Respectfully, WARD A. HOLDEN, M.D.
Member of the Committee on
Prevention of Blindness.

THE DOCTOR'S BILL.

New York, June 17, 1912.

TO THE EDITOR:

It may be sacrilegious to invade the sanctum sanctorum of your editorial department, but I can not refrain from offering a few comments upon your article, "The Doctor's Bill," by Dr. Brady, in your June issue. When the premise is wrong, the conclusion is necessarily so.

When the physician is put in the category of a tradesman, or even a professional man, like the lawyer, he is made mercenary and rendered inimical to the delicate relationship he should sustain to his patient.

These strong statements made by the doctor, "The patient's prominence or wealth has little or nothing to do with the amount of the fee justly charged," "the doctor must be either a business man or a beggar," clearly indicate to me that the doctor has a misconception of the true calling of a physician.

Dealings with one afflicted in mind and body, and loss of income should be very humane and considerate. I venture to say that with an upright and capable sympathetic physician a fee bill would be observed more in the breach than in the observance.

I admit that there are many who abuse the physician by not only neglecting to pay his just fee, but even make false charges against him for not doing so. But should this fact cause us to deal harshly with those who do appreciate our services? On a business basis, or any other basis, you are required by law and honesty to itemize a bill, especially if it be requested by your debtor. In the beginning of my practice I prosecuted delinquents and mainly succeeded in offending patient, relatives and friends. But now, after reasonable effort to collect, I drop the matter; and quite a few have returned and paid me.

The dignity of the profession cannot be kept up by large fees, nor lowered by small ones.

There are many boastful pretenders in our profession doing capital operations with big fees, and there are many competent humble physicians with modest fees, whose motto is "Lord my heart is not haughty, not mine eyes lofty, neither do I exercise myself in great matters or in things too high for me."

Excellence in medical knowledge is "sine qua non," but, unless it is accompanied by a true Samaritan spirit, it will fail of its purpose. Some physicians charge from appearances, some from actual knowledge of facts, and some from ascertaining the facts.

Where the head of the family is known to possess means, I make a full charge, but when he is a salaried man I ascertain his income and charge accordingly. Then, too, my charges are modified by the expense of his sickness and his prospects for the future. And again by the influence it will have upon the family, for money would be a curse to me if I was conscious that it deprived little children of bread.

Again, I venture to say that any physician who does not take these facts into consideration and act upon them will be a poor citizen both in and outside our profession.

Promptness, compassion, gentleness and faithfulness are characteristics of great men, and I am happy in the belief that we have many such in our profession.

Patients are oftener driven from us by large fees than by small ones. In our profession, as in others, there are unscrupulous members, and it is by their conduct mainly, new systems are created and maintained. If the practice of medicine was coupled with the practice of the golden rule, quackery would cease altogether.

Regards to Dr. Brady, who I know is an honorable man, with assurance that no offense is intended. It's only a matter of difference of opinion on a mooted question.

A. Y. REID, M.D.

VACCINE THERAPEUTICS IN PURULENT EAR DISEASES.

New York, June 17, 1912.

Editor NEW YORK STATE JOURNAL OF MEDICINE.

DEAR SIR: In the article "The Present Status of Vaccine (Bacterins) Therapeutics in Purulent Diseases of the Ear," read at the annual meeting of the New York State Medical Society, held at Albany, New York, April 18, 1912, and published in the May issue of the NEW YORK STATE JOURNAL OF MEDICINE, the author inadvertently neglected to give credit to the following authors whose articles he had read and made use of.

It was farthest from the thought and desire of the author to do these gentlemen any injustice and trust that this published statement will remove any such thoughts from their minds:

"Vaccine Therapy in Diseases of the Ear, Nose and Throat," Virginius Dabney, M.D., Washington, D. C.

"Results of Autogenous Vaccine Therapy in Acute and Chronic Middle Ear Suppurations," S. J. Kopetzky, M.D., New York, N. Y.

"The Use of Vaccine, Serums and the Hiss Extract of Leucocytes in the Treatment of Eye, Ear, Nose and Throat Infections, With Reports of Cases," J. G. Dwyer, New York, N. Y.

"Results of Vaccine Therapy in Chronic Suppurative Ears," Evelyn Wyman Nagle, M.D., Boston, Mass.

"The Basil Principles of Vaccine Therapy," J. G. Adami, M.D., Montreal, Canada.

"The Treatment of Suppurative Otitis Media (Scarlatinal) by Bacterial Vaccines (Bacterins), Paul G. Weston, M.D., John A. Kolmer, M.D., Philadelphia, Pa.

"Vaccine Therapy in Otology and Rhino-Laryngology," Robert Levy, M.D., Denver, Col.

"The Value of Vaccine Therapy in Mastoiditis, Complicating Acute Infectious Diseases," James F. McKernon, M.D., New York, N. Y.

"Vaccine and Serum Therapy in Children," Charles Gilmore Kerley, M.D., New York, N. Y.

"Some Points in the Application of Vaccine Therapy," Ernest E. Irons, M.D., Chicago, Ill.

"The Use of Bacterial Vaccines in Middle Ear Infections in Infants and Young Children," E. Mather Sill, M.D., New York.

"Results in the Treatment of Thirty Cases of Otitis Media by Vaccine Therapy," C. L. McDonald, M.D., Cleveland, Ohio.

Sincerely,
RENÉ H. HUVELLE.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF ALBANY.

ANNUAL MEETING, AT ALBANY, MAY 8, 1912.

The following officers were elected for the ensuing year: President, Leo H. Neuman, Albany; Vice-President, James F. Rooney, Albany; Secretary, Edwin L. Draper, Albany; Treasurer, George W. Pape, Jr., Albany. Three new members were elected.

SCIENTIFIC SESSION.

President's Address, A. J. Bedell, M.D., Albany.

"The Salicylates in the Treatment of Acute Chorea, With Reports of Cases," N. K. Fromm, M.D., Albany.

MEDICAL SOCIETY OF THE COUNTY OF SCHENECTADY.

SEMI-ANNUAL MEETING, AT SARATOGA LAKE, JUNE 18, 1912.

SCIENTIFIC PROGRAM.

"The Use of the Curette," F. C. Reed, M.D., Schenectady.

MEDICAL SOCIETY OF THE COUNTY OF ULSTER.

REGULAR MEETING, AT KINGSTON, JUNE 11, 1912.

SCIENTIFIC SESSION.

"Infant Mortality," H. L. K. Shaw, M.D., Albany.
"Shoes," H. P. Cole, M.D., Albany.

MEDICAL SOCIETY OF THE COUNTY OF ERIE.

Regular meeting held in the Buffalo Library Building, June 17, 1912, called to order at 9 P. M., by Second Vice-President Dr. John V. Woodruff.

Minutes of previous meeting and Council meetings of May 6th and June 12th read and adopted.

Resignation of two members were accepted.

Dr. Bonnar, Chairman of the Board of Censors, reported a barber of Lackawanna, N. Y., had been fined \$25 for practising cupping.

Resignation of Mr. Charles A. Doane as counsel for the Society was accepted with regret, and a vote of thanks tendered him for his able services in the past.

Dr. Floyd S. Crego, Chairman of a special committee reported regarding the need of a Psychopathic Ward or Hospital and recommended the construction of such a hospital. The recommendation was adopted.

Dr. Henry R. Hopkins was elected as an honorary Vice-President to the Fourth International Congress on School Hygiene, to be held in Buffalo, August 25 to 30, 1913, also as delegate to said Congress, from the Medical Society of the County of Erie.

SCIENTIFIC PROGRAM.

Symposium.

"Conservation of Vision," F. Parl Lewis, M.D., Buffalo.

"Prevention of Ophthalmia Neonatorum," A. G. Bennett, M.D., Buffalo.

"Treatment of Ophthalmia Neonatorum," L. M. Francis, M.D., Buffalo.

MEDICAL SOCIETY OF THE COUNTY OF FRANKLIN.

SEMI-ANNUAL MEETING, AT SARANAC LAKE, JUNE 25, 1912.

SCIENTIFIC SESSION.

"Bronchitis in Children," F. F. Finney, M.D., Burke.

"Smile Cataract," J. A. Grant, M.D., Malone.

"Secondary Infection in Tuberculosis," Lawrason Brown, M.D., Saranac Lake.

"General Paresis," H. W. Blodgett, M.D.

"Spontaneous and Artificial Pneumothorax in Tuberculosis," E. R. Baldwin, M.D., Saranac Lake.

"Drug Dosage in Children," W. N. MacArtney, M.D., Fort Covington.

MEDICAL SOCIETY OF THE COUNTY OF DELAWARE.

ANNUAL MEETING, AT DELHI, JUNE 11, 1912.

BUSINESS SESSION.

The following officers were elected: President, Claude R. Woods, Hamden; Vice-President, L. M. Day, Sidney; Secretary-Treasurer, Walter R. Tymeson, Franklin.

SCIENTIFIC SESSION.

President's Address, "Physicians as Teachers," L. E. Woolsey, M.D., Hancock.

"Diarrhoeal Diseases of Childhood," L. M. Day, M.D., Sidney.

"Late Achievements," H. A. Gates, M.D., Delhi.
 "Abnormal Menopause," J. A. Holley, M.D., Walton.
 "Blood Pressure," M. D. McNaught, M.D., Bloomville.

SUFFOLK COUNTY MEDICAL SOCIETY.

SEMI-ANNUAL MEETING AT SOUTHAMPTON, APRIL 25, 1912.

SCIENTIFIC PROGRAM.

"Epithelioma of the Eye Lids," S. Busby Allen, M.D., Patchogue.
 "County Tuberculosis Hospitals," William A. Howe, M.D., Deputy Commissioner of Health, New York State.

MEDICAL SOCIETY OF THE COUNTY OF ULSTER.

REGULAR MEETING, AT KINGSTON, APRIL 2, 1912.

SCIENTIFIC PROGRAM.

"Management of Normal Labor," E. E. Norwood, M.D., Kingston. Discussion opened by A. A. Stern, M.D., Kingston.
 "Abortion," J. M. Bunting, M.D., Kingston.
 "Spina Bifida," J. R. Gillett, M.D., Kingston.

THE ONTARIO COUNTY MEDICAL SOCIETY.

QUARTERLY MEETING, AT CLIFTON SPRINGS, APRIL 9, 1912.

SCIENTIFIC PROGRAM.

"Enteroptosis," H. M. Imboden, M.D., Rochester.
 "The Relations of Enlarged Thyroids to Pelvic Conditions," H. J. Knickerbocker, M.D., Geneva.
 "The Country Doctor's First Assistant," A. W. Armstrong, M.D., Canandaigua.
 "Salvarsan and the Wasserman Reaction," Raymond Sanderson, M.D.

MEDICAL SOCIETY OF THE COUNTY OF RENSSELAER.

REGULAR MEETING, APRIL 9, 1912.

SCIENTIFIC PROGRAM.

"Myocarditis," S. B. Ward, M.D., New York City.
 "Some Preventable Cases of Insanity," T. W. Salmon, M.D., New York City.
 "Saratoga and Her Mineral Springs," D. C. Moriarta, M.D., Saratoga.
 "Some Complications of Advanced Pulmonary Tuberculosis," H. W. Cary, M.D., Troy.

MEDICAL SOCIETY OF THE COUNTY OF ALBANY.

REGULAR MEETING AT ALBANY, APRIL 9, 1912.

SCIENTIFIC PROGRAM.

Symposium on Fractures.

"Morbid Processes in Repair of Fractures," H. S. Bernstein, M.D., Albany.
 "Fractures of the Skull," E. L. Draper, M.D., Albany.
 "Fractures of the Upper Extremity," G. G. Lempe, M.D., Albany.
 "Fractures of the Lower Extremity," J. L. Bendell, M.D., Albany.
 "Radiography of Fractures," W. H. Happel, M.D., Albany.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

THE PROS AND CONS OF VIVISECTION. By Charles Richet, Professor of Physiology in the Faculty of Medicine, Paris. With a preface by W. D. Halliburton, M.D., LL.D., F.R.S. Professor of Physiology, King's College, London. New York. Charles Scribner's Sons. 1912.

BRONCHIAL ASTHMA. Its pathology and treatment. By J. B. Berkart, M.D. Late physician to the City of London Hospital for Diseases of the Chest; Corresponding member of the Société Royale des Sciences Médicales et Naturelles de Bruxelles, of the Physikalisch Medizinisch Gesellschaft of Würzburg, of the Société de Médecine de Paris, etc. Revised and abridged, third edition. Henry Frowde. Oxford University Press. London, Edinburgh, New York, Toronto and Melbourne. Price, \$2.00 net.

COMPENDIUM OF DISEASES OF THE SKIN. Based on an analysis of thirty thousand consecutive cases, with a therapeutic formulary. By L. Duncan Bulkley, A.M., M.D. Physician to the New York Skin and Cancer Hospital; Consulting physician to the New York Hospital; Consulting Dermatologist to The Randall's Island Hospital, to the Hospital for Ruptured and Crippled, and to the Manhattan Eye and Ear Hospital, etc. Fifth Revised edition of the Manual of Diseases of the Skin. Paul B. Hoeber, 69 East 59th Street, New York. 1912. Price, \$2.00 net.

NEURASTHENIA SEXUALIS. A Treatise on Sexual Impotence in Men and in Women. For physicians and Students of Medicine. By Bernard S. Talmey, M.D., Former Pathologist to the Mothers and Babies' Hospital, and Gynecologist to the Yorkville Hospital. With 19 Drawings in the text. The Practitioners' Publishing Co., New York. Price, \$2.00.

SALVARSAN IN SYPHILIS AND ALLIED DISEASES. By J. E. R. McDonagh, F.R.C.S. Surgeon to Out-patients, London Lock Hospitals. London. Henry Frowde, Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912.

THE SURGICAL CLINICS OF JOHN B. MURPHY, M.D., AT MERCY HOSPITAL, CHICAGO. Volume I. Number II. Octavo of 157 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1912. Published Bi-Monthly. Price per year: Paper, \$8.00. Cloth, \$12.00.

THE SURGICAL CLINICS OF JOHN B. MURPHY, M.D., AT MERCY HOSPITAL, CHICAGO. Volume I. Number III. Octavo of 174 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1912. Published Bi-Monthly. Price per year: Paper, \$8.00. Cloth, \$12.00.

DEATHS.

ROBERT J. DEVLIN, M.D., New York City, died June 26, 1912.

EVERHARD WILLIAM DITTRICH, M.D., New York City, died June 16, 1912.

JAMES R. FAIRBANKS, M.D., Amsterdam, died June 14, 1912.

LEROY WENDELL KING, M.D., Lowville, died June 4, 1912.

JEROME HILTON WATERMAN, M.D., New York City, died June 9, 1912.

EDWIN L. WOOD, M.D., Dansville, died June 2, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

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Vol. XII.

AUGUST, 1912

No. 8

EDITORIAL DEPARTMENT

HOSPITAL CONSTRUCTION.

AT the suggestion of a well-known hospital superintendent, Dr. Goldwater of Mt. Sinai Hospital, New York, a bill has been introduced in the Senate "To authorize and empower the Public Health and Marine Hospital Service to collect, maintain and make available plans and descriptive matters relative to hospitals, asylums, dispensaries and like institutions and make provision therefor."

If the Marine Hospital Service is empowered to undertake such a work as this it would make it possible for the local committee of a community desiring to construct a hospital, to erect a building of standard construction from plans which have been drawn by men who are experts in hospital construction. At present the usual course, particularly in the case of small hospitals for towns and rural communities has been for the Building Committee or the Board of Trustees to engage a local architect who is without experience in hospital construction. Frequently he is chosen because he is the friend of somebody and the results have not always been good. It is surprising that they have not been much worse. One of the most important requisites in planning a hospital whether large or small is that the construction provide for economical administration, a point rarely heeded by architects. If the building has a handsome exterior and suitably reflects the glory of Richard Roe, the donor, the architect

is content and the Building Committee in a congratulatory frame of mind. There are many useless and expensive appendages which are often built into our hospitals which are of little value. A room and bath in a hotel is a paying investment; in a hospital it is rather out of place since a patient who is ill enough to require hospital care is usually a bed patient and therefore unable to use the private bath and toilet facilities. But nothing increases the cost of a hospital like a mass of expensive plumbing, both in first cost and in the cost of subsequent repairs. It is doubtful whether bath tubs have any place in a hospital at all. For cleansing purposes the shower is more sanitary and the patient who can be tubbed can be showered.

The use of proper material is important. Unsuitable material for flooring, such as certain forms of cement have been used in hospitals greatly to the disadvantage of the subsequent reputation of the hospital for cleanliness. It is difficult to keep certain forms of cement flooring in a slightly condition. The flooring soon loses its surface, gets rough and always looks dirty in spite of the best of care. Other forms of flooring crack easily with like disadvantages. There are a hundred similar errors of construction notable in not a few hospitals of recent construction which might be avoided if hospital architecture were standardized.

There are many such items of hospital construction which add thousands of dollars to

the bills which might be saved to some better purpose under experienced and intelligent direction. A hospital building which would be suitable on one site and for one community might be entirely unsuitable in another. When ground space is extremely valuable, the hospital must go up in the air. Where space is cheap, the cottage form may be more desirable. These matters all seem very obvious but each form of construction requires special treatment as to the location of wards, diet kitchens, laundry, heating systems with a view to economy of administration and efficiency. It is evident that it would be of immense advantage to a community if it could avail itself of the services of experts in hospital construction, leaving to the local architect and contractors the carrying out of details with such modifications of facade and ornamentation as would not interfere with the general plan of construction. Thus the hospital building would not lose individuality, but the cost of construction and what is most important, subsequent maintenance would be greatly diminished.

DISCIPLINE IN TRAINING SCHOOLS.

A YOUNG woman in the training school of a large hospital recently committed suicide because she was dismissed from the hospital after serving in its wards for two years, eight months of which she stated in a letter to the coroner, she had spent on night duty. Her home was on the Pacific coast and she was therefore, when dismissed, three thousand miles away from her closest relatives. The incident was sufficiently shocking, but while it is not the intention in any way to criticize the hospital authorities, it does seem pertinent and desirable to point out that such an episode is not calculated to relieve the present shortage of nurses.

May we not justly inquire whether a nurse who has served a hospital for two long arduous years has not acquired a claim to consideration superior to that which she had after three months, after six months. Length of service implies efficiency and ought to count for something of extenuation which would not apply to a shorter period of what certainly is a most arduous and severe service.

Without at all venturing at this time to criticize the preliminary requirements which some authorities think are responsible for the present shortage of nurses, it is our opinion that the severity of the labor and the rigor of the discipline in training schools have something to do at least with aggravating the situation. Discipline must be maintained with a firm hand. In no other way would it be possible to conduct a large training school, but anyone who has had any experience with many training schools would, we fear, come to the conclusion that humanity is not always observed in the matter of discipline. It is possible to be too severe. The writer remembers a case which happened some years ago in which for a relatively trifling offense a pupil nurse after a year in the training school was turned in the street with five dollars in her pocket, six hundred miles away from home. Nor are such instances as rare as we could wish. Capital punishment—expulsion from the school—ought to be reserved for the rarest occasion, and should be in the hands of a committee, all other discipline being entirely in the hands of the superintendent of nurses.

We ought not to forget that it is far more serious to take two years of hard and unrequited labor from a young woman and afterward deprive her of the fruits of her labor by dismissal than to discharge a clerk who has received the full equivalent of labor in a weekly wage. Twelve hours a day makes a long day. Eight months of night work in two years is depressing in the extreme to one who has been unused to that kind of toil. Hospitals in general have paid altogether too little attention to the old proverb that "All work and no play makes Jack a dull boy," and what is true of Jack is just as true of Jill. There are other fields of labor far less arduous than nursing which have been opened to women of late years. The early glamor of the cap and fichu and dainty uniform is beginning to lose its charm. Young women are finding out that nursing is terribly hard work, that the hospital is often a hard taskmaster and they are seeking easier ways of earning a living. This may be one of the reasons why our large hospitals are finding it increasingly difficult to fill their classes.

THE MODERN EFFICIENCY ENGINEER.

WE hear a great deal now-a-days about efficiency, maximum output and the standardization of work. We are told that by certain adjustments of labor the bricklayer may be made to double his output. To do this to be sure he must always go through exactly the same motions, handle each brick in precisely the same manner; never turn a brick around in his hand. In short each brick must be handled in precisely the same way and by exactly the same number of motions, for it has been found that the bricklayer makes a certain number of unnecessary movements in handling bricks, and by excluding these unnecessary motions just twice the number of bricks may be laid in a day as by the old "go as you please" method. In order to secure the best results from this discovery of the modern efficiency engineer we suppose it would be necessary or at least advantageous to the perfect working of the system to employ a sort of bricklayers' conductor with a baton or perhaps a big stick with which to beat time and give orders something as follows: Attention! Pick up your brick! Lay your mortar! Place your brick! Tap it home! Bis! Pick up your brick! Lay your mortar! Place your brick! Tap it home! Inspired by this stimulating song which could be set to music as a sort of chanty, we can readily imagine how like Aladdin's palace the walls of a building would rise skyward. We should, to be sure, miss the familiar cry from the bricklayers' platform of "mort, more mort," but the gain in efficiency would be immense. Think too of the gain to the bricklayer. He would be turned into a brick-laying machine. His arms would rise and fall like the pistons of a reciprocating engine as brick after brick was laid in four motions and a pause.

A proposition such as this seems like a parody and yet it has been made in all gravity and soberness by an apostle of efficiency. It is quite evident that he is neither a psychologist, a physiologist nor a physicist.

The output of the human engine must keep pace with the calories consumed by the furnace and when by such methods as these, the human engine is driven to an output of more foot pounds than can be accounted for by the calories provided by the food, it is evident

that the engine will be driven to its destruction, since repairs will not keep up with combustion and waste. Men cannot be turned into automata without rapid deterioration. Apart from the purely physiological side of the question which seems to have been overlooked entirely by these apostles of the speeding up system the psychological side is not to be neglected nor the sociological. Such a process of automatism will have its inevitable effect on the mentality of the race. There is nothing better calculated to bring about the evolution of defectives than such a crazy and absolutely inhuman system. Individualism is the basis of a sound social system, but automatism ends in the death of individualism. One of the great faults of our modern factory system with its sharp division of labor is that it absolutely fails to produce a real workman with a pride in the product of his hands. The Swiss watchmaker who worked through the long winters over his bench and vise surrounded by Alpine snows was more of a man and a better citizen than his successor who works in a factory 300 days in a year, ever making the same little wheel. Such a man deteriorates both mentally and physically and society, which has by its relentless and selfish methods brought about this condition of things will eventually pay the price. It is paying the price already in the heavy toll of the occupational diseases. Tuberculosis is, after all, largely an occupational disease, produced by bad feeding, bad housing, bad hygiene, all of which are evils flowing from our modern civilization. Civilization we call it. It is rather modern barbarism. Civilization ought to mean the making of a good citizen. Instead of that it means a thousand evils for the working man, the creation of the fiercest of class hatred and the demoralization and degradation of the race. If there is one thing more than another that is making for the destruction of the American citizen, it is the crazy pace which we have set which is filling our asylums with lunatics, the schools for feeble-minded with half idiots and our hospitals with the victims of an early arteriosclerosis. As physicians we are able to recognize the evil and we ought to exercise the little influence we possess and at least urge the adoption of sane methods. The human engine is just like any other combustion engine. There is a certain amount of work to be gotten out of it and no more. It may be driven to pieces in a short time like a racing automobile or it may do the same amount of work but spread over many useful years. The best civilization is that which results in the conservation of the citizen by the State rather than his destruction by a remorseless Moloch which wraps the workman in red hot arms to his damnation.

Original Articles

VERTIGO FROM THE STANDPOINT
OF THE GENERAL PRACTITIONER.*By CHARLES G. STOCKTON, M.D.,
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VERTIGO consists in a disturbance of equilibrium together with a complex of some or all of the following symptoms: Tinnitus aurium, obscuration of vision, flicker scotoma, transient hemianopsia, nystagmus, nausea and vomiting, vaso-motor derangement, numbness and other paresthesiæ. It is called *subjective* when the vertiginous motion seems to belong to the patient, and *objective* when the disturbance appears to depend upon unnatural and contradictory movements of external objects. Either form may occur alone or both at the same time, occasionally accompanied by a feeling of compulsion.

Vertigo must always be regarded as a disturbance of the vestibular nerve as related to the semi-circular canal and as connected with the cerebellum as well as with the centers of consciousness.

Since appreciation of our location in space is so largely dependent upon hearing and seeing, it is no matter for surprise that a consciousness of disruption of equilibrium should be subjectively related to the apparatus either of vision or audition. This impression is not inconsistent, for there can be no doubt of the fact that vertigo is, in the majority of cases, merely a symptom of disease, located primarily in the apparatus of seeing or hearing.

When we recall the complicated arrangement of innervation by means of which we maintain our orientation, it will be understood that derangement of this faculty may depend upon a great variety of factors, varied in kind and in location, the only essential being that untoward impressions must reach some neurone whose concern it is to contribute to our realization of balance and our relation with place. Thus it is that vertigo is a manifestation of central nervous disease; and thus it is that it may owe its inception to intoxications, or to derangements of circulation, abnormalities that start remote from the brain, but which necessarily reach the central nervous system and touch, directly or indirectly, the vestibular nerve.

Circulation.—While not always a consistent part, vertigo may be associated with the symptom complex of syncope or fainting, and apparently depends upon disturbance of circulation in the vessels of the semicircular canal. As this result may follow an insufficiency of the blood supply, so, conversely, it

may depend upon an excessive supply of blood, or congestion of the vessels of the central nervous system. In these facts we have a ready explanation for the appearance of vertigo in patients who suffer from functional or structural disease of the heart, or blood vessels, from aneurism, or other tumors pressing upon the superior vena cava or the great venous branches coming from the head, or from any other disease offering obstruction to the return flow of blood. A similar result may accompany pulmonary emphysema, asthma or other thoracic diseases which impede the flow of blood through the right side of the heart. The symptoms, with slight or moderate degrees of intensity, follow the relative cerebral ischemia which occurs in victims of aortic insufficiency, advanced aortic stenosis and, especially, degeneration of the myocardium. Sufferers from these conditions become accustomed to giddiness which follows mental or physical activity, and which is occasioned by lack of arterial blood, sometimes coincidentally with the excess of venous blood, at the cerebral centers. In such, the disturbance in equilibrium, while greater in some patients than in others, is rarely severe and is obscured by the more striking sensations of weakness and failing consciousness which belong particularly to syncope. When the patient is called upon to analyze his sensations, he will usually admit that giddiness or loss in the sense of equilibrium, constitutes a part of the experience.

Vertigo frequently accompanies tachycardia, probably because, with the incomplete systole, the column of arterial blood is poorly sustained, with resulting disturbance in nutrition at the center of balance. A similar experience accompanies certain cases of arrhythmia, whether the latter depends upon auricular fibrillation or upon extra-ventricular systole. It occurs in a pronounced form in the bradycardia of partial or complete heart block. This obstruction to circulation, which sometimes leads to sudden loss of consciousness from syncope, may at other times show itself in marked giddiness, and this may continue until the conductivity through the His bundle is temporarily improved.

There is a severe type, usually seen in young people, which from the manner of its evolution, is called epileptic vertigo, although it is unaccompanied by the ordinary seizures of epilepsy.

Hysteria.—In some instances of hysteria, vertigo appears to result from direct oversensitiveness of the labyrinth, and in other instances it is induced indirectly through circulatory derangements which the hysteria excites. It may occur with throbbing vessels, flushed face and mental excitement; or with great depression of circulation, an algid sur-

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face, and the general appearance that suggests syncope. Very often this is associated with a visceral crisis, hysterical in nature.

Visceral Disease.—Certain abdominal affections, without the intervention of toxemia, and apparently without hysteria, may give rise to disturbance of equilibrium, usually moderate in degree, amounting merely to unsteadiness and sometimes rising in intensity so as to produce intense giddiness. This occurs, for instance, with enteroptosis and, especially, with floating kidney. The symptom is felt when the upright posture is assumed and quickly subsides upon lying down; it is apparently associated with low blood pressure, which becomes yet lower when the patient stands. Irritation of the pneumogastric or the splanchnics may be in a measure responsible for this. Occasionally it accompanies renal or biliary calculus, but in these instances the element of auto-intoxication cannot be wholly excluded.

Auto-intoxication.—There is a well-fixed doctrine that vertigo is a common symptom of disease of the liver, stomach and intestine. A certain amount of giddiness or unsteadiness is, indeed, frequently experienced by patients suffering from various disorders of these parts, yet, in my experience, it is very unusual to see an attack of true vertigo, fully developed, depending upon such causes. Exceptionally, however, it does occur, and is sometimes violent in character.

Complex Causes.—In all of these cases there is a liability to error in attributing the vertigo solely to the abdominal disturbance, when in point of fact there is at the same time an undiscovered disease, directly or indirectly involving the semicircular canal. Before attributing an attack of vertigo to the liver, a most exhaustive search should be made for cerebral, middle ear, or labyrinthine disease, or some affection of the ocular apparatus. Granting that there is over-sensitiveness of the vestibular nerve, it may require merely an additional disturbance of its nutrition, which may be found in intoxication or in disturbance of the circulation, to lead to a fully developed attack of vertigo,—a vertigo which would not develop from slight sensitiveness at the centers of equilibration, unaided by the extrinsic or abdominal disturbance.

The Liver.—Having thus propitiated the criticism that is likely to follow the ensuing statement, I am now prepared to say that I have seen intense and repeated vertigo which I believe to originate solely in functional disease of the liver. The matter can be best understood from a brief description of a case:

A man of fifty, of excellent habits, leading an active life, suffered from a sudden and

severe attack of vertigo which necessitated his lying down and remaining so for several hours. A thorough physical examination revealed a moderately enlarged liver, the lower border of which extended nearly two inches below the free border of the ribs. The eyes and ears were carefully examined, but this contributed no additional cause for the vertigo; an auto-intoxication was supposed to accompany the hepatic derangement. The urine, taken during the attack, was highly acid, but was free from bile-coloring matter and urobilin. Six months later came a second attack, and since then three others, all of them violent, and lasting from five or six to twenty-four hours; occasionally accompanied by vomiting and pallor. There was very little, if any, tinnitus; on one occasion the liver was tender upon pressure. For the past year he has been exempt from trouble and attributes this relief to the systematic taking of glycocholate of soda.

We often encounter giddiness as an accompaniment of cholemia, yet it may occur, even without jaundice, in temporary congestion of the liver, associated with constipation, especially, after indiscretion in eating or drinking. It would seem to be an over-statement to class such symptoms with true vertigo, although doubtless there is a disturbance of the realm in which vertigo dwells. I have seen no vertiginous symptoms more severe than these to result from dilatation of the stomach, or any other gastro-intestinal condition, except in those individuals who have definite local irritation of the labyrinth or eye strain.

Unknown Causes.—A colored woman of 40, referred to me by Dr. Smallman of Ellicottville, has suffered for years from Meniere's syndrome, with the exception that tinnitus is absent. The symptoms never reach the violence of true Meniere's disease. She presented no stigmata of hysteria, and careful examination appeared to exclude disturbances of circulation or the presence of auto-intoxication. The aural examination by Dr. Fairbairn revealed an over sensitive state of the labyrinth, but not enough to demonstrate local disease. Dr. Francis found a moderate degree of uncorrected astigmatism. The case was not satisfactorily explained notwithstanding exhaustive examinations. This illustrates the fact that vertigo may depend upon unknown causes.

Renal Disease.—Giddiness of moderate degree often results from renal inadequacy; fully developed vertigo is an occasional manifestation of uremia, as it may be of other severe intoxications, caused by diseases such as diabetes, cirrhosis of the liver, hyperthyroidism, etc. Vertigo is an occasional symptom in that group of disturbing factors pro-

ducing high blood pressure. It is rather difficult to say how much of this depends upon an auto-intoxication, how much upon the high blood pressure, and how much upon an accompanying arterial change.

Arteriosclerosis.—Arteriosclerosis alone or associated with senility may produce vertigo, which sometimes is almost continuous. Such states are doubtless the result of interference with circulation in the brain, and, therefore, are outside the privilege of this paper to discuss.

Gastric Vertigo.—I am not convinced of the importance of so-called "gastric vertigo"; at any rate it does not seem to me that it should be described as a special type. Most cases which have been referred to me were ultimately shown to depend, at least in part, upon some other source of disturbance. Less intoxication results from stomach than from intestinal diseases. When vertigo depends upon the stomach, it is usually because of secondary effect upon the heart and the vasomotor nervous system.

Sénès of Paris, discussing this subject, reports that of 828 patients suffering from stomach trouble, 55 complained of gastric vertigo, but in 30 of these the symptom was traced to aural defect, renal disease, arteriosclerosis, or tabes. In 15 it was dependent upon neurasthenia, intoxication, circulatory disease or gout. In only ten did the dizziness appear to arise from dyspepsia, and possibly in some of these it depended upon the stomach.

Sénès fails to state in what proportion of these cases the vertigo resulted from eye-strain, which is in accord with the views of most Europeans on this subject. The majority of cases of so-called "gastric vertigo" which I encounter are not completely relieved until ocular errors are corrected.

Cecal Stasis, or "Cecum Mobile."—Cecal stasis even in the absence of enteroptosis, or "cecum mobile" (as demonstrated by radiograms), is sometimes the source of persistent giddiness. This disappears when the cecum regains the proper motor efficiency. Probably coprostasis, with subsequent intoxication, is the source of the vertigo.

Gout.—Gouty patients may suffer from vertigo, representing one of the group of symptoms which precedes or presages an arthritic attack. It is also a familiar symptom in those who escape acute podalgia but suffer from so-called sub-acute gout, or lithemia. More often in those past middle-age who have neglected customary out-door exercise, and who have too much indulged the craving for proteid food, the metabolism is overworked and, together with irritability, lassitude, habitude, ocular disturbances and head-

ache, there is marked unsteadiness with giddiness, and sometimes marked vertigo.

There is a striking individual difference as to the effects of intoxicants upon equilibration. This is seen in the remarkable susceptibility exhibited by some individuals to the action of alcohol, quinine, the salicylates, etc., a predisposition which seems to be analogous to that exhibited by some people to seasickness and car sickness.

Treatment.—It is expedient to have the eyes carefully refracted, and such relief given as may be possible to any aural defect, before attempting to relieve a vertigo that may in part depend upon an intoxication or circulatory disturbance. Several elements may be simultaneously at work, and we should attempt systematically to remove them one by one. In the treatment of obscure cases, or those which depend upon irritability of the vestibular innervation, I have had most success in following the advice of Charcot and Giles de la Tourette; that is, the administration of quinine or salicylic acid in sufficient doses to produce tinnitus. At first the symptoms are aggravated. The treatment should be continued for about three days. Following this there is improvement, sometimes the complete disappearance of vertigo, and it may remain absent for a considerable period of time. I have had little success with bromides, as recommended by Gowers, except in large doses and rather continuously. So much for the treatment of vertigo in general. Since there are many factors which may be involved in the etiology of vertigo, it naturally follows that a variety of therapeutic indications present themselves.

To correct faulty digestion, to secure sufficient gastro-intestinal drainage, to relieve, through dietetic reform, the overtaxed metabolism, to improve general elimination and to establish, so far as possible, the normal flow of unirritating blood—these include the ends which we should seek to obtain for the relief of vertigo dependent upon general causes.

OCULAR VERTIGO.*

By PERCY FRIDENBERG, M.D.,
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THE psycho-physical reaction which forms the subject of my paper might be characterized as a confusion of sense of space and balance due to abnormal visual impressions. In contradistinction to the definite and limited phenomena of stimulation and sensory-motor response in labyrinthine vertigo, we note in the ocular variety a multiplicity and a certain vagueness of features as well. This applies to the

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causative factors, the symptoms, and the local manifestations, and is to a certain extent indicated biologically in the physiology of the two sense organs. In the labyrinth we have a terminal reacting to only one mode of adequate stimulation, that of rotation, with a definite sensation, that of subjective turning, and a specialized motor accompaniment, fixational nystagmus. But one factor of space and balance concepts, that of exclusive right or left motion, *i.e.*, rotation, is concerned, so that disturbance of labyrinthine function causes a pure rotational vertigo with definite clinical data for study and comparison. The visual component in space concepts is much more complicated, and the resulting impression a combined one. Position, distance, direction, proportion of size, are involved and the resulting concept is a summation of ideas giving to consciousness its judgment of the outer world and the relation of that external world in static and progressive balance to the subjective self. Accordingly, we find that ocular, or more correctly "visual," vertigo may be caused by any irregularity in the sensations entering consciousness by way of the eye, and that the disturbance itself is not characteristically or truly a vertigo, but rather an indefinite dizziness which may, however, be marked and is almost always accompanied by other unpleasant symptoms. Our visual impressions depend on the function of a light-conducting as well as a light-perceiving apparatus. The transparent media, refraction, and the focussing apparatus, accommodation, represent the first, in conjunction with the extrinsic ocular muscles active in fixation. The retina and nerve, and the cerebral centres, mediating the sensations of color, light and form, and giving the possibility of single vision under binocular fixation in an extended visual field, form the second component. Disturbance in any one of these functions may and does cause "ocular vertigo." Purely retinal stimulation, alone, such as may be due to excessive, rapidly varying, or unusual illumination, is a fruitful source of dizziness. This dizziness from dazzling may be noted after looking at cinematographic pictures, stereopticon projections, and so on. Any anomaly of refraction or accommodation which causes either visual strain or confusion of sight may cause vertigo. It is worthy of note and of some practical importance that small, even minimal errors, are much more productive of eye strain and consequent dizziness than marked anomalies. The higher degrees of hypermetropia, myopia and astigmatism cause dim vision which is accepted with, as it were, sub-conscious philosophy. The small degrees, on the other hand, almost invariably produce a state of tension depending on an effort to correct by accommodation, head tilting or other means the indefinite disturbance of function. Continued over-exertion of accommodation, gradually leading to tonic spasm, or irregularly distributed in astigmatism, is a most prolific source of dizziness. As these low degrees are

easily overlooked in rough tests without cycloplegics, another element of danger is added in the probability that they will escape detection. It need hardly be added that, even in adults, complete paralysis of accommodation may have to be induced for an accurate determination of the refraction, and that in children it should be made the rule.

Disturbances of ocular motility play a prominent rôle in eye strain and ocular vertigo, either independently or in conjunction with refraction error. Under physiological conditions, vertigo may be induced by muscular strain incidental to rapid or irregular eye motions even if—or rather, particularly when—of small excursion. The rapid readjustment of eye position incidental to accurate fixation of objects in rapid motion, as in looking out of a car window, watching a waterfall, and so on, are instances in point. Anomalies of ocular motility resulting in disturbance of binocular single vision cause marked confusion and are usually associated with distressing dizziness. Here again we note that small errors are the most annoying. In paralysis of an ocular muscle with conscious and evident diplopia and widely separated double images, there may be no disturbance at all, whereas when the double images are close together, as in partial palsies, the confusion is marked. Even in the absence of conscious diplopia a muscle strain, spasm, imbalance or insufficiency causing lack of precision in fixation may result in obstinate vertigo. The factor of judgment seems to enter into these reactions as if dizziness did not result, in spite of disturbed vision, when the interference is correctly interpreted by consciousness. This is shown very clearly in experimental ocular vertigo by prisms, swinging mirrors, and so on, where vertigo comes on very suddenly and as suddenly disappears when we realize the external and artificial character of the disturbing factor. Clinical experience shows that lateral anomalies are more easily corrected and less often a source of trouble than imbalance of the vertically acting muscles, and that here again, literally, minimal degrees are the most important. We need not again call attention to the practical deduction that most careful and complete tests of ocular balance after correction of refraction are essential in the recognition and alleviation of ocular vertigo. While general dimness of vision is not a cause of dizziness, confusion may easily be caused by a localized interference with sight such as a partial loss of the visual field or central scotoma due either to functional or organic disease of the nerve or retina, or mechanically produced by opacity of one or other of the transparent media. Here it is the varying and irregular nature of the disturbance of vision which causes confusion, the object appearing and disappearing without warning, according as it is fixed with a normal or a diseased part of the visual apparatus. While

ocular vertigo is not characteristically rotational, it may be severe, obstinate and prolonged. It is almost always associated with general malaise, nausea, and even with vomiting. More generally these disturbances are less violent but so persistent and ingrained as to give the impression of gastro-intestinal disease and suggest a diagnosis of nervous indigestion, biliousness, liver trouble, neurasthenia, and so on. While the manifestations of ocular vertigo may be protean, there are certain characteristic symptoms which should attract our attention and arouse suspicion. Thus, dizziness coming on after prolonged near work, reading or writing under electric light, on rising from the desk, after theatre or concerts, or in the morning immediately after, or which is relieved by closing the eyes, resting in a dark room, or temporarily interrupting near work, inevitably suggests eye strain and ocular vertigo. The ocular factor, be it ametropia, accommodative anomaly or ocular imbalance, can only be accused after careful examination, but these features are significant. Diagnosis by exclusion is furthered by the beneficial effect of complete rest induced by cycloplegics. After the accommodation has been paralyzed, patients often state voluntarily that the dizziness has disappeared and deprecate the necessity of wearing glasses. Occasionally it is necessary to keep up this enforced rest of accommodation and let the patients regain short range vision gradually in the course of several weeks or months under full correction of ametropia. After all, our diagnosis of ocular vertigo is generally made, *ex juvantibus*. If eye strain is the etiological factor, correction of ocular anomalies should relieve the symptoms. In any other event, we have at least excluded the ocular factor, and must look further for the underlying cause. We may at least be assured that it is not a case of "ocular vertigo."

LABYRINTHINE VERTIGO.*

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SINCE tympanic lesions causing vertigo do so only through the labyrinthine disturbance to which they give rise, it is obvious that in one sense all forms of aural vertigo are labyrinthine. As commonly used, however, the term, labyrinthine vertigo, is applied only to types of vertigo dependent upon disease actually involving the labyrinth itself. Even so defined, the theme is much too broad for appropriate treatment in the limited time allotted me. It is necessary, therefore, to apologize in advance for my very cursory and inadequate presentation of the subject.

It is clear that an individual who is suddenly attacked by severe vertigo of any type may be

quite unable to analyze, and still less to describe, his subjective experiences. A practical clinical study of vertigo must deal, therefore, less with the patient's subjective impressions—though these also may be taken into account—than with associated objective phenomena, *e.g.*, nystagmus, disturbance of static equilibrium, direction of swaying or falling, etc., which distinguish one form from another.

So far as we are at present able to recognize them, there are but two definitely characteristic types of labyrinthine vertigo, *viz.*, (1) *the vertigo of vestibular irritation*, and (2) *the vertigo of vestibular paralysis*. We shall take time to describe briefly these two widely different manifestations of labyrinthine disorder.

The first type—*i.e.*, the vertigo of vestibular irritation—may be caused in two ways, *viz.*, (a) by comparatively mild forms of acute vestibular inflammation or congestion, which irritate the end-organs of the vestibular nerve without abating its function; and (b) by severer lesions causing sudden ablation, or at least marked diminution, of vestibular function and irritability, and whose action is, therefore, in effect equivalent to irritation of the opposite sound labyrinth. That is to say, the two vestibular mechanisms, balancing each other, act as one organ. If one labyrinth is suddenly paralyzed or destroyed, the unbalanced activity of the remaining sound organ produces for a time all the characteristic phenomena of vestibular irritation. Among these is included vestibular vertigo.

Characteristic Features of the Vestibular Type.—The vertigo of vestibular irritation, whether induced by experimental irritation of the labyrinth or resulting from acute labyrinthine disease, always conforms to the following conditions: Subjectively it is rotary in character—*i.e.*, the patient has the subjective impression of the rotation about him of surrounding objects, *e.g.*, the furniture, the floor and walls of the room, etc. If he closes his eyes, he experiences the sensation of himself rapidly rotating or whirling in one or another direction.

Objective Phenomena: Invariable Presence of Nystagmus.—During the attack, this form of vertigo is always accompanied by some grade of vestibular nystagmus—*i.e.*, a nystagmus composed of a quick eye movement in one direction and a slow return movement in the opposite direction. The close inter-relation of this vertigo and nystagmus is shown by the following fact, *viz.*, that conditions causing exaggeration of the nystagmus cause simultaneously increase in the subjective vertigo. Thus sudden or exaggerated movement of the head usually causes noticeable increase in the nystagmus, and this increase in the nystagmus is invariably reflected in proportionate increase in the severity of the subjective vertigo. Again, voluntary rotation of the eyes in the direction of the quick nystagmic movement regularly increases the nystagmus and

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as regularly causes increase in the vertigo. This has led Barany to formulate the rule that vertigo which is not accompanied by nystagmus, and is not influenced by the position of the eyes, is not of vestibular origin.

Disturbance of Static Equilibrium; Direction of Falling.—The vertigo of vestibular irritation is always accompanied by a characteristic form of ataxia, or disturbance of equilibrium, which also bears a constant relation to the nystagmus present. The patient falls, tends to fall, or sways in the direction opposite to that of the quick nystagmic movement; and since this relation of the falling direction to the nystagmus is maintained in whatever position the head may be, it is obvious that he will exhibit a tendency to fall in different directions in accordance with changes in the position of the head. Thus, standing erect with the head in the natural position, a patient with rotary nystagmus to the right falls or sways to the left. If he turns his head in the direction of his right shoulder, he falls forward; if he turns his head to the left, he falls backward.

Direction of Error or Deviation in Pointing With Eyes Closed.—A normal person with eyes closed, having located some stationary object by sense of touch, can withdraw or lower the hand, and then point fairly accurately to, or touch again, the object so located. On the other hand, a person suffering from vestibular vertigo points regularly to one or the other side of the object he seeks to touch; and the direction of his error or deviation corresponds with the direction in which he tends to fall. In other words, his hand or finger deviates in the direction opposite to that of the nystagmus present.

Relation of the Subjective Vertigo to the Nystagmus.—Returning to a consideration of the subjective vertigo, we find that this also is in no sense an independent phenomenon of the disease, but bears in every case a constant relation to the nystagmus present. Thus, the characteristic feature of the vertigo is the subjective impression of the rotation about him of surrounding objects; and this seeming rotation is always in the plane of the nystagmus. For example, the plane of the most pronounced type of rotary nystagmus is vertical—*i. e.*, when the patient is supported in the upright position; and while maintaining this position his subjective impression is of the rotation of surrounding objects in the vertical plane. If, however, he assumes the recumbent position—*i. e.*, lying upon his back—the plane of the nystagmus is changed from the vertical to the horizontal, and now surrounding objects seem to rotate about him in the horizontal plane. Again, after rotation upon the revolving chair, a normal individual, standing erect, exhibits a horizontal nystagmus, and things seem to revolve about him in the horizontal plane.

Both the vertigo and the ataxia thus exhibit

a constant relation to the nystagmus present. Additional proof of this relation is found in the fact that when the vestibular mechanism is irritated, either experimentally or in the course of acute labyrinthine disease, the characteristic vertigo and ataxia invariably disappear wholly as soon as the nystagmus has completely subsided. Usually they disappear a little in advance of the nystagmus.

To reiterate:—A study of labyrinthine vertigo is largely a study of the associated phenomena. Absence of a single essential feature may in certain cases enable us to exclude the labyrinth as the site of the underlying lesion or disorder. We may illustrate this process of exclusion by the following somewhat dogmatic negations:

(1) Vertigo which is not accompanied by some grade of vestibular nystagmus is not dependent upon vestibular irritation.

(2) Vertigo accompanied by disturbance of static equilibrium, in which the direction of falling or swaying is not influenced by changes in the position of the head, is not dependent upon vestibular irritation.

(3) Vertigo which is not aggravated by quick or sudden movements of the head, or by voluntarily rotating the eyes in one or the other direction, is not due to vestibular irritation.

(4) Vertigo accompanied by irregular, arrhythmic oscillations of the eyes—*i. e.*, a nystagmus not definitely characterized by a quick movement in one direction and a slow return movement in the other—is a characteristic feature of certain cases of neurasthenia (Barany). It has no known relation to any lesion or disorder of the labyrinth.

(5) Vertigo associated with nystagmus objectively identical with the vestibular type, and accompanied by a tendency to fall constantly in one direction irrespective of changes in the position of the head, and by normal caloric reactions,—these phenomena in association form a symptom-complex which characterizes certain cases of cerebellar abscess, but is never induced by disease confined to the labyrinth.

(6) The same syndrome, changed only by the presence of a negative caloric reaction in one ear, would point very strongly to a double lesion—*i. e.*, cerebellar abscess complicating suppurative labyrinthitis of the ear in which caloric irritability is absent.

Vestibular vertigo may be caused by labyrinthine hyperæmia, paralabyrinthitis, serous labyrinthitis, circumscribed purulent labyrinthitis, diffuse suppurative labyrinthitis. The variations in the attendant clinical phenomena by which the vertigo present in any given case may be traced to one or other of these lesions do not fall within the scope of this paper.

The Vertigo of Vestibular Paralysis.—So far as the writer knows, he was the first to describe

a type of labyrinthine vertigo, quite distinct from that caused by vestibular irritation, *viz.*, the vertigo of vestibular paralysis. It might well be called the vertigo of defective orientation.

After the symptoms of vestibular irritation have completely subsided, the patient as he rests quietly in bed is no longer conscious of any subjective disturbance of equilibrium. He has passed the stage when every sudden movement of the head induces nystagmus, and its attendant phenomena. When he first gets out of bed and attempts to stand, however, a new and bewildering dizziness seizes him, and unless supported he is likely to fall. Being helped to a chair, this unexpected vertigo soon leaves him. His next attempt at walking is more guarded and careful, and though somewhat unsteady at first, he rapidly regains his sense of static equilibrium. Though the dizziness returns at intervals during the day, the attacks are of short duration and always coincident with physical efforts requiring changes in the position of the body. The attacks grow rapidly less pronounced and less frequent, so that within a few days the patient may begin to regard himself as cured. On attempting any physical act to which he has not re-accustomed himself, however, he is likely to experience an alarming recurrence. On first attempting to walk down an inclined plane—*e.g.*, in going down stairs—he may experience sudden and severe vertigo, and unless support is at hand, he may fall. Again, when he first attempts to walk in the dark—*e.g.*, in getting out of bed at night—he may lose all sense of direction, and this may cause him to fall. Having had these experiences, he undergoes a rapid process of subconscious education, and may soon go up and down stairs without fear or danger, and soon learns to maintain his equilibrium without the aid of sight.

In order to comprehend these intermittent and transient seizures and to recognize them as a logical manifestation of the latent stage of any destructive form of labyrinthitis, it is necessary to consider briefly the rôle of the two vestibular organs as part of the complex mechanism presiding over man's subconscious power of maintaining his equilibrium.

There is no question that the two vestibular organs (vestibules, semi-circular canals and vestibular nerves) play a most important rôle in what is known as orientation, or the subconscious knowledge of the position of the body in space; and that if orientation is disturbed, the faculty of maintaining one's equilibrium is impaired. This disturbance of equilibrium is always associated with some grade of subjective vertigo. On the other hand, that the vestibular organs cannot be regarded as essential organs of orientation is shown by the fact that after removal of one or both labyrinths, the individual soon regains the subconscious faculty of maintaining his equilibrium. It is necessary to as-

sume, therefore, that the mechanism of orientation is a complex one, to the formation of which certain complementary factors contribute; and these are found in the tactile, the muscular and the arthro-dial senses and the sense of sight. While the vestibular organs confer the subconscious knowledge of the relations of one's body to the three planes of space, the muscular and arthro-dial senses inform one of the relations of the various parts of the body to the other parts, or, in other words, they enable one to appreciate subconsciously and correctly and at any moment the position of each part of the body in relation to all the other parts. When one part of the complex mechanism of orientation is destroyed, its function must be assumed or compensated for by the parts remaining intact. Mr. A. T. Slinger and Sir Victor Horsley have proved experimentally that when sight is lost, the arthro-dial and muscular senses become more sensitive and accurate. When one or both labyrinths are destroyed, sight, touch and the muscular and arthro-dial senses undergo a process of involuntary education and so enlarge the scope of their activities that orientation is re-established and maintained. Until this process of involuntary education is well advanced and the organism has accommodated itself to this readjustment, it is not surprising that occasional severe attacks of vertigo should result from any unusual physical effort.

Short as these attacks are, a little thought will convince us that this is a form of vertigo which may subject its victim to no inconsiderable risks. For example, a swimmer believing his recovery from suppurative labyrinthitis to be complete, may dive into the water and suffer a disturbance of equilibrium from which he may not recover in time to save himself from drowning. A chauffeur, resuming too soon his occupation, a workman upon a roof or upon the scaffolding of a building in process of erection, or a sailor in the rigging of a vessel, may experience unexpected vertigo which may lead to a fatality. Or, finally, to cite a more commonplace situation, the patient, believing his recovery complete, may in crossing a street turn or recoil at the unexpected sound of an automobile horn, thereby inducing a disturbance of equilibrium causing him to fall when falling means death. The physician must recognize this phenomenon as a possible and perfectly logical manifestation of the latent stage of any destructive labyrinthitis in order that he may deter his patient from assuming unnecessary risks.

While it is true that many patients pass through the latent stage of a destructive labyrinthitis without ever experiencing these attacks in a form sufficiently severe to strongly impress the medical attendant, this is due to the fact that he is protected by chance or the timidity born of his recent illness from a too sudden resumption of his normal physical activity. Also, in some

individuals orientation is perfectly re-established much sooner than in others. In any case, such moderate and fleeting attacks of vertigo as the patient may experience may be attributed to the weakness resulting from his recent illness, and may, therefore, fail to impress either him or his physician with their true significance. The writer has had the opportunity of studying several typical and rather pronounced cases of vertigo accompanying the latent stage of suppurative labyrinthitis, which have been described somewhat in detail in an earlier paper.¹

Before leaving the subject, the writer would like to say just a word as to the treatment of the two types of vertigo referred to in this paper. Ordinarily, the symptom itself does not call for surgical treatment for the following reasons:

(1) If due to a lesion producing sudden ablation of function of one labyrinth, the resulting vestibular vertigo regularly subsides as the organism accommodates itself to dependence upon one vestibular organ.

(2) If due, not to ablation of the vestibular function, but to direct irritation of one labyrinth, this irritation is usually either temporary or soon gives place to vestibular paralysis,—either result leading ultimately to subsidence of the vertigo. This does not mean that the underlying lesion may not require surgical intervention, but simply that the vertigo *per se*—being self-limited—calls for no such drastic measures for its relief.

(3) The vertigo of vestibular paralysis—a phenomenon in many cases hardly noticeable, reaching in others a considerable degree of severity—regularly subsides as the faculty of orientation is re-established.

The vertigo of vestibular irritation is to be treated by absolute rest in bed until all symptoms of vestibular irritation have completely subsided.

The vertigo of vestibular paralysis, on the other hand, would be most surely guarded against by a system of regulated physical exercises through which the patient might be educated to retain his sense of equilibrium under any physical conditions to which accident might subject him.

A comparatively rare condition, occasional cases of which have been reported, is characterized by recurrent vertigo of vestibular type. The patient, a victim of chronic middle ear suppuration of long standing, and having survived one or more acute labyrinthine attacks, is subject to recurrent paroxysms of vestibular vertigo. This sequence of events,—showing successive exacerbations of a suppurative process, each of which is capable of causing vestibular irritation, and any one of which may lead to diffuse purulent labyrinthitis—points to a dangerous condition calling more or less urgently for surgical intervention.

VERTIGO DUE TO MIDDLE EAR CAUSES.*

By JAMES F. McKERNON, M.D.,
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THERE is but little to say regarding vertigo having its origin in pathological conditions in the sound conducting mechanism.

Whatever the more remote cause, the immediate one must be stimulation of the end organ of the vestibular nerve by disturbance of intra-labyrinthine pressure, at least in the cases under discussion. As most of the middle ear conditions are acquired gradually, no sudden disturbance of the intra-labyrinthine pressure is likely to arise, but if it does occur compensation rapidly takes place and the vertigo disappears. The pathological condition most liable to give rise to vertigo is a sudden and complete occlusion of both eustachian tubes. The air in the cavity of the tympanum undergoes absorption and the ventilation of the middle ear being shut off, there is a consequent marked retraction of the membrane, which is accompanied by an inward movement of the foot-plate of the stapes. The patient is suddenly deaf, complains of stuffiness and tinnitus and has subjective sensations of dizziness which, if sufficiently severe, may be accompanied by a disturbance of equilibrium. This condition is but transient. Relief is obtained by the opening of the tubes either by the catheter or bougie. Even when the impairment of hearing and tinnitus persist the vertigo disappears, either by restoration of air pressure behind the drum membrane or by accommodation within the labyrinth itself.

The ordinary catarrhal processes within the middle ear are not, as a rule, accompanied by vertigo. The reason is obvious—even if examination reveals a mal-position of the drum membrane with more or less plastic exudate, and with marked impairment of the mobility of the ossicular chain, the changes have been so gradual that probably never in the history of such a case has the patient made any special complaint of dizziness.

There is one point of interest in these chronic catarrhal middle ear cases; it would seem that the state of the middle ear renders them specially prone to the so-called "stomach" vertigo, which, as is well known, is really toxic in character. It would, therefore, be wise, in persistent vertigo of this origin, to submit the ears to an examination both physical and functional, and some attempt should be made, whenever these indications exist, to combine treatment of the ears with that directly aimed at the alimentary tract.

There is another middle ear condition which must not be ignored in its relation to obscure otitic vertigo, and that is oto-sclerosis. The

¹ Kerrison: Vertigo of vestibular paralysis; Trans. American Otolological Society, 1911.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

otologist is gradually becoming educated away from the belief that oto-sclerosis necessarily involves the neighborhood of the oval window, and that fixation of the foot-plate of the stapes must inevitably follow in every case; although its existence as a separate pathological entity was, at least in the first place, recognized in such cases. It is now very generally acknowledged that other parts of the labyrinthine capsule may be the point of attack and while the same argument applies to the gradual progress of the disease and to the absence of sudden profound disturbance within the labyrinth, still the possibility of a persistent irritation of this nature in the neighborhood of one or the other of the points of ultimate distribution of the vestibular nerve should not be overlooked or ignored. It is granted that vertigo is not a common complaint in cases in which the diagnosis of oto-sclerosis is easily made, but is it not perhaps possible that the vertigo in certain obscure cases in which the functional examination does not reveal a fixation of the stapes, may be due to similar changes in other parts of the labyrinthine capsule?

The suppurating middle ear, especially of the chronic variety, is the most fruitful source of otitic vertigo, in that it is the starting point of a purulent invasion of the labyrinth. This part of the subject is, however, discussed in another paper of this symposium.

There is also a type of case which suffers from purulent otitis media and is especially liable to recurrent attacks of vertigo, although functional examinations reveal at times a considerable residue of hearing, and a normal or rather hypersensitive vestibular apparatus. These are cases of the so-called "perilabyrinthitis" and are doubtless simple chronic purulent cases progressing to involvement of the labyrinth itself. Effusion with sudden disturbance of pressure occurs at intervals, and each attack is characterized by marked vertigo, nausea and disturbances of the equilibrium. When the attack subsides hearing remains as before and the vestibular apparatus is still readily irritable. The occurrence of this train of symptoms in a case of chronic purulent otitis media is of very special significance. It should be the object of the aurist not to wait until the labyrinth is involved, but immediately to perform the radical operation. In this way the progress of the disease is stopped, the remnant of audition is conserved and the patient is saved the possible consequence of an acute invasion of the labyrinth.

Cholesteatoma beginning in the attic and extending through the aditus may in a similar manner be the cause of vertigo. This would be produced by a perilabyrinthitis or by direct extension to an involvement of the labyrinth itself. Conditions within the external auditory canal do not, as a rule, give rise to vertigo, but under certain circumstances a plug of cerumen may do so, especially if it be in contact with the drum

membrane, and produces vertigo by mechanical pressure upon it. Removal of this impacted mass cures the vertigo. The presence of exostoses within the deeper structures of the bony canal may also, at times, cause vertigo. When this occurs, the bony growth is in the form of a hyperostosis, has no distinct pedicle, is deeply situated and encroaches upon the ring and drum membrane.

The vertigo in these cases is due to vascular changes, and occurs at irregular intervals. Trauma of the drum membrane is at times accompanied by vertigo. This can be most naturally explained by interference with the incudo-stapedial articulation and is similar in character to that occasionally observed when this structure is accidentally injured during an incision of the drum membrane.

A dislocation of the foot-plate of the stapes produces a disturbance of intra-labyrinthine pressure with the immediate appearance of vertigo, even accompanied by nausea and vomiting as well as a spontaneous rotary nystagmus. Should no actual infection of the labyrinth take place, the symptoms disappear in the course of a few hours.

The following brief outline of a case illustrates the occurrence of vertigo in trauma of the drum membrane:

R. L., a man aged fifty-two years, was riding horseback through thick underbrush when he suddenly experienced a sharp pain in his right ear, followed at once by dizziness and nausea. He returned to the club house and remained in bed the remainder of the day. His friends noticed a few drops of blood at the external auditory meatus. The following day his dizziness and nausea were more pronounced and he came to the city to obtain relief.

Physical examination disclosed some dried blood on the floor of the external auditory canal, and protruding through the posterior quadrant of the drum membrane in the region of the incudo-stapedial articulation was a piece of dried twig from a dead limb that had evidently punctured the drum and broken off at the time he first experienced his pain and first attack of vertigo and nausea.

Removal of the twig with the usual treatment for a solution of continuity of the drum membrane brought about a speedy relief and cure of the symptoms exhibited.

Another case, briefly described, calls attention to a somewhat unusual source of vertigo, having its origin in the conducting apparatus.

A school boy, sixteen years of age, had been subjected to a simple mastoid operation ten years before coming under observation. The middle ear had undergone prompt healing, but there had persisted a post auricular sinus large enough to admit the tip of the forefinger directly over the antrum and communicating with the

middle ear by a wide aditus. On examination the boy presented a perfectly healed membrane and a functional test demonstrated the hearing to be normal. The patient sought relief on account of repeated attacks of vertigo and volunteered the information that he was obliged to keep the sinus tightly filled with cotton to prevent these attacks, and that in the absence of the cotton the slightest exposure to cold air would precipitate an attack of vertigo.

There can be no doubt that this was a case in which the cold air, acting on the over-exposed vestibular apparatus, produced an effect similar to that which is obtained in making a caloric test with cold water.

The sinus was closed by a simple plastic operation one year ago, since which time there has been no recurrence of the vertigo.

Many attacks of vertigo are attributed to the middle ear when first occurring, but upon subjecting the patient to a physical and functional examination their origin is found in other parts of the auditory apparatus. Some have their ætiology in the gastro-intestinal tract and are toxic in character, while others are due to circulatory disturbances and cannot therefore be classified as being produced by pathological conditions existing in the middle ear cavity.

Discussion.

DR. JOHN E. WEEKS.—The vertigo that accompanies abnormal conditions of the eyes is due (a) to the inability to form distinct images on the retina, affecting one or both eyes as the case may be consequent on errors of refraction; (b) to the inability to easily "register" the images in binocular vision under static or dynamic conditions as occurs in muscular imbalance; (c) because of diplopia induced by paresis or paralysis of extrinsic ocular muscles. The two last mentioned conditions may be termed faulty orientation, the last being decidedly of this character. The disturbance consists almost wholly of subjective symptoms; there may be a sensation of confusion when one looks from the page after an attempt to use the eyes in the presence of an uncorrected error of refraction; there may be a sensation as of the falling or jerking of the head in some direction, peculiar to the case, and a disturbance of equilibrium not resulting in falling when walking, or a confusion vertigo, possibly with nausea when watching a cinemetograph or riding in a rapidly moving vehicle. The objective symptoms of the vestibular vertigo, namely, the nystagmus, falling to one side, before or backward, are not a part of ocular vertigo. The subjective symptoms of rotation, vertigo persisting when the eyes are closed and when the patient is recumbent, are not those of ocular vertigo. If when the patient is suffering from ocular vertigo the eyes are closed or progression is not attempted the vertigo ceases at once, or very shortly. Ocular vertigo is essentially a confusion vertigo, affecting the

cortex of the cerebrum, excited by imperfect visual functions. It is not necessarily or commonly indicative of disease.

DR. FRANCIS VALK: When asked to discuss this subject I shall try to do so, not from a pathological standpoint, but from the functional conditions of the eyes. In this connection, then, I would consider the subject of "Vertigo due to ocular causes" as in the subjective form, that is to say, as the symptoms may be stated to us by the patient as the history is given. I can hardly think that one may be afflicted by a vertigo that may be objective, except so far as the extreme dizziness and actual falling may be due to a sudden paresis or paralysis of one of the ocular muscles, either traumatic or due to some pathological condition. Here we may find the history of sudden dizziness, even to falling almost unconscious as the sudden appearance of the image formed in the deviating eye may so confuse the cerebral centers that equilibrium is destroyed, the patient may have complete loss of orientation with extreme dizziness or vertigo. This was well illustrated to me in a case during the days of tenotomy for heterophoria and in this connection I may say I hope the operation of cutting the ocular muscles will soon pass into "innocuous desuetude," but, to resume, in this case, a young lady with slight exophoria was operated upon by a tenotomy, a bandage applied and put to bed. The next morning when the doctor called the dressing was removed and as she was standing by the bed she promptly fell to the floor, not unconscious but from the severe vertigo due to the complete loss of orientation. Her operated eye had turned in from the tenotomy of the externus. It required six months to correct the traumatic squint. We may consider this as an example of an objective vertigo as we have a decided "disturbance of equilibrium produced by the reflection of an abnormal stimulus upon a more or less non-resisting equilibratory apparatus" and in which the cause and effect was apparent. Hence we may consider this as a fair example of the extreme disturbance of vision when the visual acuity of each eye was normal and when the receptive apparatus was conscious of two, more or less, distinct images, vastly separated, with no ability to bring about fusion. Consequently, we can readily note the disturbance of the equilibration and the extreme vertigo due to that condition. As subjective vertigo, while it is a symptom of many diseases of both organic and functional affections, in the present case we have to deal only with what we call functional conditions, in which we may consider vertigo as a reflex, or as Fisher would call it, a referred symptom, due to some ocular conditions but not to any one specific cause. As Hansell has well said, we find this vertigo accompanying "accommodative strain and muscular insufficiency." Now, I am not willing to accept the general term of refraction as a cause of vertigo as I cannot

see any reason for a special accommodative strain in simple myopia nor in the usual conditions of astigmatism, but we do meet this symptom in many cases in which too much demand is made upon the eyes when the accommodation is weak, and particularly so when they become presbyopic. I am inclined to think we have this symptom of vertigo more pronounced in the condition of absolute hypermetropia after they have passed the age of forty years. This we may consider as true subjective vertigo, as they will complain of the constant feeling of dizziness and in which they hardly realize the deficient accommodation with the general blurring of the vision. Here we have that indistinctness of vision that so much interferes with perfect orientation with the consequent uncertainty of the location of the ground on which they walk, and again, we have that "disturbance of equilibration" and the subjective vertigo. Now, in my experience we can find the cause of vertigo in the condition of refraction, as noted above, absolute hypermetropia, that is to say, a hyperopic eye, which has lost its accommodative power and the vision at infinity has become blurred and indistinct. Here the constant strain on the accommodation in the effort to see clearly may produce the symptoms of vertigo and dizziness, which will quickly disappear under the use of proper glasses. The same reasoning may be applied to these cases when the eyes are used at the near point as the act of accommodation may be great enough to overcome the hypermetropia but cannot compensate for the extra strain at the near point. In this connection I would like to report a case of vertigo due to the refraction that is unusual. Mr. H., age 54. Has been in good health and not used glasses. About six months ago he had an attack of indigestion, and then could not see well. In reading all the words seemed joined together, and he also had tinnitus aurium and vertigo. On examination his refraction was found to be a high myopic astigmatism axis 90° of nearly three dioptres, but his vision = 20/15. These glasses, when worn constantly, relieved all the subjective symptoms. It seems evident to me that this man, in his previous good health, had corrected his extreme astigmatism by an unusual action of the ciliary muscle, until the age of 54, when the accommodation became too weak to respond and we have the subjective symptoms. It is interesting to note that the vertical planes of this man's eyes were emmetropic and that the horizontal planes were myopic from the increased curve of the cornea, as this was only 7.4 mm.

Associated as a symptom with vertigo we have the frequent history of nausea, and if we take these two symptoms, as dizziness and nausea, we find this history very frequently related in those in which we find a want of muscular balance, that is to say, an imbalance of any variety where the visual line of the one eye is not in accord

with the other eye. Hence we may say that any condition of heterophoria may be the essential cause of the vertigo and the nausea. In this connection I wish to speak of a special condition of the motor apparatus of the eyes which I have noted for the past few years. I think we may class esophoria as the most prominent variety of heterophoria, one that we meet most frequently and one that does not yield readily to prism exercise, as does exophoria. Now, in esophoria I have frequently found an unusual tendency of the eyes to turn to the right, a condition which I have called dextrophoria. This condition, in my opinion, has a vast influence in the successful results of our operations on the ocular muscles. It has been my experience that if this complication is present in a case of esophoria, that an operation on the right eye is not indicated, but that if any operative interference is performed it must be on the left eye. An examination of the ocular rotations, version, with the tropometer of Stevens will make this reason perfectly clear.

DR. J. A. KENEFICK.—Dr. Kenefick spoke of preventive measures in the treatment of nurslings under one year of age with single or double otitis. Without anæsthesia the forefinger should be passed into the naso-pharynx and the adenoid masses there crushed. With a proper myringotomy this method has succeeded in prompt healing and thus preserving the young apparatus intact.

DR. EDWARD D. FISHER.—I think we want to look at vertigo in two ways, that is, the lighter forms and the severer forms, where the patient has a tendency to turn, as the word means. In the more severe form we can look upon some organic disease of the brain as the cause. Some few of them will give us that, that is, cerebellar lesions. In experimenting on monkeys years ago, where I removed half of the cerebellum on one side, the monkey kept going in one direction, and then recovered and got absolute equilibrium in a few days. We get such symptoms in some of the early organic conditions of the brain. Dr. Collins has mentioned involvement of the cerebello-frontal lobe. We find it also in lesions as generally regarded of the temporal lobe, where we have the termination of the auditory nerve in the cortex or subcortical region. I think, however, the most violent form of vertigo I have ever had my attention called to has been more functional than the organic type. I think the neurasthenic type, or the type referred to by Dr. Stockton, is similar to the type where we have intestinal fermentation. The severest forms of vertigo I have seen would fall under that class rather than be applied to any organic disease of the brain. I have seen it, although rarely, in some organic diseases, such as tabes, where it could not be ascribed to the eyesight because in these cases one eye was totally blind. In other instances it was due to disease of the auditory nerve. The only thing that the discussion

has shown is that every point has to be investigated. We have been accusing the eye, the ear, the stomach, and then before possibly a long time the patient falls into the hands of the neurologist, or at least, I think he does.

DR. T. H. FARRELL.—I do not feel that I can add anything to what Dr. Fridenberg or Dr. Weeks have said on this subject of ocular vertigo. I would like to emphasize one thing Dr. Fridenberg mentioned in his paper, and that is, it is the low degrees of refractive error which produce ocular vertigo. This throws a heavy burden on the oculist because of the failure to correct the astigmatism within one quarter diop-
tre, or even less, or to correct the axis within five or ten degrees, which may vitiate all his work. I believe this emphasizes the absolute necessity of examining these cases under a proper mydriatic, and repeated examinations, if one examination fails to relieve the vertigo.

DR. ALEXANDER LAMBERT.—There is another point of view from our experience in this particular line of work which we must not overlook. For instance, one who is engaged in general practice not infrequently finds patients who complain of dizziness, and our attention may be directed to the intestinal tract or to some form of arteriosclerosis, and attention given to these two points will clear up the trouble. If the dizziness is due to intestinal trouble, a very slight mercurial purge to stir up the liver or to empty the intestine may be sufficient to relieve the dizziness in the vast majority of cases. In the arteriosclerotic patient, those agents which tend to tone up the vessels rather than those which tend to dilate them seem to give more satisfactory results. Then there comes the intense forms of vertigo which one has to deal with. These cases had better be turned over to the oculist or even to the otologist, and perhaps as a last resort to the neurologist.

DR. LUCIEN HOWE.—Of course we all appreciate the importance which the eye plays in these cases. I believe that is admitted. The point I want to make is that we are still in doubt as to the best methods of determining the conditions of the eye. Landolt first showed what a large part accommodation played in these cases, and that when this was attended to many of them were relieved. He did not, however, point out the importance of the extra ocular muscles, as was done later. Many of us forget that we do three different things. First, we accommodate; second, we converge, and third, we perform a very important function, and one which is too often overlooked, that is, the upper end of the vertical axis turns slightly outward. We knew that long ago in the laboratories. Landolt showed the proportion of torsion in regard to the proportion of convergence, but we neglected this also because of the lack of suitable instruments of diagnosis.

When this third factor, namely torsion, is taken into account, we find that we can deal

more intelligently with cases of vertigo than is possible otherwise. I do not think a discussion of this subject would be complete without calling attention to the necessity, first, of a thorough and patient examination, and, second, to taking into account all the facts that enter into this problem.

DR. A. L. BENEDICT.—Dr. Stockton has been obliged to leave to take a train and has asked me to close the discussion. I want to emphasize the importance of the fact, so well brought by Dr. Stockton, and so generally not appreciated: that vertigo is not a common symptom of gastric, hepatic and intestinal conditions. Perhaps this misconception originates with seasickness, *nausea*, which term is commonly used now for any tendency toward vomiting. Any condition, whether of extrinsic movements of a boat, swing, hammock, etc., various ocular disturbances affecting the sense of equilibrium, or functional or organic disturbance of nerve centers which leads to vertigo, actually does produce nausea also, in the great majority of instances. It is a natural but incorrect converse belief that a digestive disturbance with its tendency to vomiting, should lead to vertigo. Barring ocular conditions and the extrinsic and strictly nervous types of vertigo which, of course, are not often encountered in a digestive practice. I have been surprised at the regularity with which vertigo is marked by indicanuria and apparently caused by the antecedent intestinal putrefaction. This observation has a bearing on some other remarks that have been made, regarding intestinal toxæmia. It is even possible that the vertigo accompanying putrefaction and suppuration in the cavities of the head may similarly be toxæmic and not due to lesions of nervous structures directly.

DR. PHILIP D. KERRISON.—The question has been asked as to whether deaf-mutes are subject to vertigo. This is an interesting question which can only be answered provisionally. Deaf-mutes may be divided roughly into two classes, namely, those totally deaf and those having certain islands of hearing. The totally deaf again may have a congenital or acquired defect practically destroying both cochlea and the vestibular apparatus. Where both these structures are destroyed, it is evident that the patient would not be subject to vestibular vertigo. If, however, the lesion or defect were confined to the cochlea he might still be subject to typical vertigo of vestibular irritation.

I have had the opportunity of examining two cases of deaf-mutism acquired through syphilis in which the auditory nerves were paralyzed. Both of these patients could be rotated in the revolving chair without any evidence of vestibular irritation. One of them, while he experienced no rotary vertigo, exhibited the peculiar disturbance of equilibrium which I have tried to describe as due to defective orientation.

DR. PERCY FRIDENBERG.—In regard to visual vertigo, I referred in my paper to the importance

of correcting any error of refraction and ocular imbalance. This should be done in a most painstaking manner. 'I did not go into the details, as it is a matter that is generally recognized.

MEDICAL EXPERT TESTIMONY FROM THE LAWYER'S STANDPOINT.*

By WILLIAM ARCHER PURRINGTON,

Of the New York Bar.

Mr. President, Ladies and Gentlemen:

YOUR allotment of topics for this series of papers imposes upon each reader the difficult obligation of abstaining from trespass on the others' domains. When Macaulay was a wee boy he had a small garden plot marked out by dividing lines of shells or stones. One day the future historian, whose wonderful memory was even then stored with scriptural texts, rushed into the house, his petticoats bristling with grief and indignation, crying, "Cursed be Sally, Cursed be Sally, for it is written, 'Cursed be he that removeth his neighbor's landmark.'" It transpired that the maid had thrown away the division lines of his plot. It shall be my effort, if not to say anything new, at least to stick to my text, keep within my time limit, and try to escape the curse meted out to him who removes a landmark.

The topic of the next paper, "Medical Expert Testimony From the Justice's Standpoint," indicates that those who chose our subjects considered either that judges are not lawyers,—a theory held by some who are not physicians—or, at all events, that the standpoints of judges and lawyers differ.

For the latter assumption there is foundation. In the actual trial of causes there is a necessary difference between their functions, however much they may agree that the purpose of litigation is to arrive at truth and justice between parties. Under our system of law, this desirable end is presumed to be attained better through controversy than by inquisition. The attorneys of the respective litigants come into court to maintain opposing contentions. Let them be the most high-minded of men, men who would disdain to offer evidence that they knew to be untrue, to influence witnesses to deviate from the truth, to mis-state consciously either the law or the facts, or to do any of those things that are sometimes,— "'tis true 'tis pity and pity 'tis 'tis true"—resorted to by the unscrupulous in order to win a cause; let all this be so, nevertheless, they will be of necessity partisans to some extent. They will not,—at least, all of them will not—obey Lord Brougham and forget everything but the cause, everyone but the client, God, country and even self,—his lordship, by the way, did not usually underrate the importance of self; but if

the cause is one that, as laid before them, offers in their honest judgment fair and debatable contentions upon the law, the facts, the scientific theories, they will recognize the obligation to present their side of those contentions to their best ability, consistently with honor and with fairness; and neither honor nor fairness forbids an advocate to avail himself of those rules of law and practice that are from experience presumed to be adapted to the ascertainment of truth and justice in the long run, even though in certain cases they seem to inflict hardship, and to protect the wrong rather than the right.

But if it is the attorney's duty and privilege to be partisan, it is the judge's to be impartial, to see that the respective contentions are presented in accordance with law and decorous practice, to enforce rules of evidence, not tacitly or expressly waived, to instruct the jury as to the law, but to leave it to weigh testimony, including credibility of witnesses, and to decide the facts, except where the failure or weight of evidence justifies dismissal of the complaint or direction of a verdict, which, however, in criminal cases, cannot be directed against the accused.

Yet, although in the court room lawyer and judge may differ in their standpoints towards particular litigations, before this audience they will probably agree.

Whether our controversial system is the best means of arriving at truth and justice, or whether, as many think, the inquisitorial system prevailing in continental Europe and with our Latin neighbors is a more scientific and accurate method, is a question both sides of which may be sustained by persuasive arguments, which cannot be here examined. We are to deal with our system as it is, including its method of adducing expert testimony, as to which we hope for improvement, even though years of efforts toward that end have not borne much fruit. This amendment, however, is beyond the limits of my topic. To discuss it might bring upon me from my friend, Dr. Dana, the anathema reserved for those who respect not landmarks.

In the court room we have a judge sitting, as another distinguished person once sat, "high on a throne of awful state," either to umpire the game,—as the attorneys hope he will do—or to engage more actively in the conduct of the case, with a chance of reversal if he take it too much out of the hands of counsel. Before him are the counsel of the litigants. On the stand are the witnesses. In the box are twelve presumably intelligent and true men to decide the issues and perhaps to pass upon technical matters of science beyond not only their knowledge, but their powers of comprehension.

Out of all these forces comes as a resultant, the verdict. To win that verdict is the aim of each litigant's attorney. He starts with the assumption that the merits of the case are with him and need to be disclosed rather than dis-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

covered. From his standpoint, expert testimony is one of the means for disclosing these merits. In other words, it is one factor in obtaining the desired verdict; or, to speak even more bluntly, it is, accordingly as it favors or discredits his contention, a means of winning or an obstacle to be overcome. That, generally speaking, is the view taken of medical and all other expert testimony, from the lawyer's standpoint.

Now, medical jurisprudence, as you know, is the department of learning that is concerned with the application of the science of medicine to the solution of legal problems in the courts. The problem is, for instance, Did A murder B? That is a question solely for the jury to decide upon the facts disclosed by the evidence. But on the way to their decision jurors are confronted with subsidiary problems that can only be solved by the application of knowledge quite beyond the experience of ordinary men. What was the physical cause of death? Was it morphine poisoning caused by the felonious administration of the drug? Was it uræmic poisoning, and only a result of natural conditions? Are the symptoms of the two poisonings so similar that their causes may be mistaken, or are they readily differentiated? These questions can be answered only by persons of special learning and experience: experts, they are called. Even they, as a rule, cannot answer the scientific questions positively. They may honestly entertain differing views; but if they will speak with reasonable certainty, their opinions are received by the court, either is founded upon personal observation of the facts or conditions in issue, or if based upon the testimony of the witnesses embodied in a so-called hypothetical question. But in either case their opinions must be subjected to the sometimes acid test of cross-examination, that searches the qualification of the witness, the soundness of his views, his scientific bias and his interest in the case.

The ordinary witness is, as a rule, allowed to testify only to what are called "facts"; to what he has learned through his senses and by personal observation. He is forbidden to express impressions or opinions, save in those special instances where without such expression his testimony cannot be given clearly, and even then his opinion may not be expressed until he has testified to the facts personally observed by him from which the opinion is derived. Our Court of Appeals has lately said that it is the general rule in this state in receiving all opinion evidence, even that of experts, that the facts upon which the opinion is based should be spread before the court, either by the witness' testimony to his personal observation or by a hypothetical question. One exception to this rule is said to be that where the issue is A's mental condition, a medical expert may give his opinion derived from personal observation without first stating the facts upon which he bases it, these being left to be brought

out in cross-examination (*Weibert vs. Hanan* 202 N. Y. 328; cf *People vs. Youngs* 151 N. Y. 210; *People vs. Faber* 199 N. Y. 256, 266, 267). As a general proposition, said the same court, in *Dougherty vs. Milliken* (163 N. Y. 527, at p. 533), "there are two classes of cases in which expert testimony is admissible. To the one class belong those cases in which the conclusions to be drawn by the jury depend upon the existence of facts which are not common knowledge and which are peculiarly within the knowledge of men whose experience or study enables them to speak with authority upon the subject. If, in such cases, the jury with all the facts before them can form a conclusion thereon, it is their sole province to do so. In the other class we find those cases in which the conclusions to be drawn from the facts stated, as well as knowledge of the facts themselves, depend upon professional or scientific knowledge or skill not within the range of ordinary training or intelligence. In such cases not only the facts, but the conclusions to which they lead, may be testified to by qualified experts. The distinction between these two kinds of testimony is apparent. In the one instance the facts are to be stated by the experts and the conclusion is to be drawn by the jury; in the other, the expert states the facts and gives his conclusion in the form of an opinion which may be accepted or rejected by the jury."

All this seems simple enough. But we come to a stumbling block the moment we ask, What is a fact? What is an opinion? The latest writer upon facts does not attempt to define the term. A famous English jurist despaired of doing so. In a federal case (*Huber vs. Guggenheim* 89 Federal 598, 601) a fact was defined as "something fixed, *unchangeable*"; yet in an action at law one fact in issue may be the condition at a given time.—I will not say of a woman's, but of a man's, of a politician's, even of a candidate's mind. How can that be called *unchangeable*? It has been said, in various attempts at legal definitions, that facts are "occurrences and events" (76 *Indiana* 575, 579); that they are realities, not suppositions; that they are actions; deeds (10 *Howard's Pr.* 155, 161), and so on. An opinion has been defined as a "judgment formed or conclusion reached, especially a judgment formed on evidence that does not produce knowledge or certainty"; "a belief held as a result of inference and not of direct perception." Now, as you know, all "facts" are "opinions"; even those ascertained by what is called direct perception. To illustrate by an actual case: A was convicted of B's murder upon a disinterested witness' testimony that he saw A pursue B and stab the latter as he turned on his pursuer. This testimony was accepted by the court as a statement of "facts." But a new trial being obtained, it transpired that while A did pursue B, and the latter did turn on his pursuer, yet it was B who, when turning, drew the knife, stumbled and fell upon it, and

not A who stabbed him. The testimony of the first witness to the pursuit, the flash of the knife, the fall and the dead body were, metaphysically speaking, a series of correct inferences. The remaining facts, as they were called, that A drew the knife and stabbed B were mistaken inferences. Obviously, it is not possible to exclude opinion evidence or always to tell just what opinion evidence is. Whether A is mad or not, is said to be a fact, but it is a fact that can only be established by opinion based upon other so-called facts ascertained through observation. These facts may be such as ordinary persons, observing under like conditions, would apprehend and narrate in much the same way,—their accurate observation requiring no special knowledge—or they may consist in pathological conditions only to be recognized by persons of special training. Thus, even a layman may testify that he has seen A change from a refined, intelligent, humane, modest gentleman to a coarse, stupid, brutal person guilty of indecent and cruel acts within the observation of the witness, who may then testify to the impression produced upon him by all these things, namely, that A was mad. Courts have even declared that such lay opinion of friends and neighbors, based upon frequent or daily observation, affords better data for judgment than the opinion of scientific men, based upon hypothetical questions. But relevant pathological facts beyond the range of common knowledge and the conclusions therefrom are within the exclusive domain of the medical expert, whose opinions, however, are not controlling, but may be rejected *in toto* by the jury, while both they and his qualifications as an expert, together with the accuracy of his data, are to be tested, as already said, by cross-examination, the omission of which from any reform would be a reversion to the time when juries tried cases of their own knowledge and experts advised the court *ex parte*.

Such being the general rule under which opinion testimony is adduced, attorneys, who are presumably legal experts, call for aid upon physicians or surgeons whenever the light of medical science is needed to illumine what is dark. This aid is rendered before going into court by giving opinions upon the facts, by formulating a theory of the case, by suggestions as to the mode of eliciting those opinions in evidence and by reference to the scientific authorities. After coming into court, the medical expert aids by giving testimony in support of his opinions and by suggesting the weak points in the medical case of the other side. As the attorney is the legal, so is this expert the medical counsel. But there is between the two a great difference, out of which has arisen much of the criticism of experts; the attorney will present his client's cause to the best of his ability, but he will not take the witness stand to sustain it by his oath. If he is true to the traditions of his profession, he

will not even in argument throw into the scales of justice the weight of his personal character by expressing his individual convictions upon the merits of the cause. Yet that is precisely what the medical expert does. He combines the functions of counsel and witness. In this two-fold capacity he can scarcely fail to have some bias; and the learned justice, who will bring up the heavy artillery when this rapid picket firing is over, will give you, no doubt, the opinions of many judges upon the weight of this testimony, omitting possibly that of Lord Bramwell—I think it was Bramwell—the brother of a well known expert in patent causes, who is said to have divided liars into four classes, "liars, damned liars, experts and my brother John."

Now, the lawyer recognizes not only that these experts may be biased, but that they may be mistaken, or that they may predicate differing honest opinions upon differing states of facts, presented by the questions put to them. A distinguished physician once said to me that medical science can diagnose and prognosticate as accurately as I could calculate the parallax of a star. That is probably true, for I can't calculate the parallax of a star. What we all know is that physicians once in a while,—it may be a very long while—are mistaken. We wonder not at that, but rather that they are so often right in view of the difficulties with which they contend; the unwillingness and the inability of patients to state their symptoms truly; the complex nature of their problems.

The attorney's problem is to obtain an honest expert opinion upon an honest statement of facts. He has a right by cross-examination to ascertain if that course has been followed by the other side. A reputable witness naturally resents questions suggesting that his testimony is biased. As a rule, attorneys refrain from asking such questions of reputable medical men. Yet good professional standing and membership of the best societies do not insure credibility. Any witness who testifies under promise of compensation for his testimony is discredited to some extent. His interest is to be weighed by the jury; if that interest sways his testimony he is absolutely discredited. A year ago, Louis E. Schapiro, an attorney, was disbarred on account of such an agreement with a surgeon in good standing and a member of reputable societies. The case is reported in volume 144 of the Appellate Division Reports at page 1. It is highly instructive. Schapiro represented a client whose leg had been amputated following an accident. The client's surgeon received an agreement that he should have as much for his testimony as the trial counsel. Schapiro testified that he gave this agreement because the surgeon threatened that if it were not given, he would testify in accordance with the hospital records, that the amputation was necessitated by tuberculosis of the leg, thus defeating the action. Such an agreement, if re-

vealed, would certainly have discredited the surgeon as a witness; but on the trial he testified that he had no interest in the case and no understanding as to what his pay should be. The Appellate Division considered that the fact that the attorney, Schapiro, sat by and heard that testimony without contradiction was of itself professional misconduct. They not only disbarred the attorney, but suggested the advisability of presenting the conduct of the surgeon to the district attorney.

It is legitimate, therefore, although a most disagreeable task, to inquire into the expert's pecuniary interest in the cause, if there is reason to believe that it affects his testimony. The hypothetical question is another fair object of attack. The attorney is generally satisfied that it has been framed by the witness who is to answer it, and, perhaps, so framed with qualifying words as to enable him to answer it satisfactorily. In recent years some of these questions have excited just condemnation and derision. Extending over several pages, they are intricate and foolish. Every question is foolish that the jury cannot follow, and bear in mind. The answer is simply disregarded.

Experts often complain that they are not treated fairly because they are not allowed to testify as they wish to do. One famous expert has even written that he has had more difficulty of this sort in his direct examination, by attorneys retaining him, than upon cross-examination. For this there would seem to be only three explanations: negligent preparation of the case, inability of counsel to conduct his direct examination, or dishonesty, which the expert might prevent by saying in advance, "I must testify to such and such state of facts, and opinion, or not at all." It must be a very exceptional case in which an honest and capable expert cannot in the course of direct and cross-examination with the aid of the court give his real opinion. It is probably true that the adverse counsel will not intentionally aid him to expound his theory of the case; but he will often do so unintentionally. A very clever cross-examiner in a delightful book has thus ingenuously described his own method:

"The art of the cross-examiner should be directed to bring out such scientific facts from the knowledge of the expert as will help his own case, and thus tend to destroy the weight of the opinion of the expert given against him. Another suggestion which should always be borne in mind is that no question should be put to an expert which is in any way so broad as to give the expert an opportunity to expatiate upon his own views, and thus afford him an opportunity in his answer to give his reasons, in his own way, for his opinion, which counsel calling him as an expert might not otherwise have fully brought out in his cross-examination."

A famous poisoning case prosecuted by the author just quoted illustrates his methods. An

expert for the prosecution testified that decedent's heart was of normal size and weighed about six ounces and one drachm, and later that it "was a healthy and normal heart." An expert called for the defense testified that a normal heart in a woman of decedent's description "would weigh about eight ounces or eight and one-half ounces," and that one weighing six ounces one drachm would be decidedly subnormal; but at the close of his examination he testified fairly that the decedent's heart was of normal size. The result of this attempt by the defense to discredit the People's expert was only to give the prosecution opportunity to ask on cross-examination: "It now appears that you did examine that very heart yourself and found it was a normal heart; did you intend to deceive the jury?" A. "I did not." No one who knew the witness believed that he did try to deceive. But if the heart was normal, and the defense did not intend seriously to contest the fact, it was a tactical error to question it at all. In the same case, a well known medical author, having testified explicitly that "it is not possible to positively diagnose morphine poisoning by the symptoms alone," basing his opinion, as he said, partly upon his wide reading and what seemed to be the general consensus of professional opinion, but *very largely on his own experience*, which included a mistaken diagnosis corrected by post mortem examination, was at once asked on cross-examination whether an autopsy was a necessary factor in his diagnosis; evidently the witness relied on the history of the case if the symptoms did not suffice. But he was not quick at verbal fencing. He was then driven to admit that within twenty years he had had only one case of morphine poisoning, and this was a more serious matter. This extract was then read from one of his books: "I have thought that inequality of the pupils is proof that a case is not one of narcotism, but Professor Taylor has recorded a case of opium poisoning in which it occurred." He was then asked whether he had informed himself when he so wrote that the man mentioned by Taylor had only one eye. He answered: "Not according to my remembrance," and was dismissed, with the information by counsel that that fact had been proved in the pending case. Now, here was a witness of excellent repute, especially as a text writer, quite discredited by a cross-examination directed to his qualification, rather than to scientific issues, yet entirely legitimate, since a witness who avowedly relies largely upon his personal experience cannot complain if its meagreness is exhibited to the jury. Had the cross-examiner out of deference to the witness' standing in the medical world refrained from that line of examination, he would have failed, from a lawyer's standpoint, in his duty. Lately, it was my own very unpleasant duty, acting for a defendant, to examine a physician upon whose diagnosis the plaintiff had brought an action against

a dentist, to recover damages for an alleged "paralysis of her seventh facial nerve in the inferior dental branch contiguous to the teeth," due to the defendant's maladministration of cocaine. This theory of the plaintiff was absurd, as my expert advised me. Upon trial, I handed the physician an articulated skull and asked him to trace the course of the seventh facial nerve, in its inferior branch, and show its connection with the teeth. The result was so pathetic as to cause me genuine distress, so hopelessly ignorant was the witness of the anatomy. He broke down, admitted that the charge was absurd, and left the room. The complaint was dismissed, and the plaintiff's lawyer said to me: "I went out to congratulate him, but he had fled." One of the greatest evils of expert testimony is that in the absence of any standard of qualification, any licensed physician may offer himself as expert in any branch of medicine; and many who do so do not even read up their subject. They are, to this extent, impostors and merit exposure.

From the lawyer's standpoint, then, the great essentials of an expert are his qualification in his profession, his honesty and his ability to withstand cross-examination, which is, if not Ithuriel's spear that no falsehood could resist, at least the weapon of nearest approach to that celestial temper. One who is often an expert makes a record that becomes known. His mistakes haunt him. If he has testified in a similar case, in a dissimilar way, he will be likely to hear of the difference before his ordeal is over. But it may be said with assurance that the medical expert who is qualified in his subject, courteous, self-contained and, above all, honest, will create no antagonism and has nothing to fear at the hands of the lawyer. But the witness who is supercilious, ill-qualified, quick tempered, biased, more intent on maintaining his cause than in testifying frankly, has very much to fear from a cross-examiner of even moderate ability, and there is no reason why he should claim any immunity from the tests applied to all other witnesses, or feel when they are applied that his professional dignity has been assailed.

THE MEDICAL EXPERT, AND THE PROPOSED CHANGES IN THE LAW GOVERNING THE DEFENSE OF INSANITY IN HOMICIDE CASES.*

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THAT there exists today a diminution in the respect once paid to scientific medicine and consequently to the opinion of the physician is unquestioned.

This is in part due to the struggle which now exists between the materialistic philosophy of

the nineteenth century and the older psychic philosophy which has re-arisen under new names but really in its antique form. Besides this there are many faults which are justly chargeable to our profession, but which are beyond the scope of this paper, as well as those which are found in our methods of dealing with medical evidence, and both classes have played their part in producing this situation.

The effect of these factors is clearly shown in the diminished importance which medical evidence now plays in our courts, and especially is this marked in what formed so important a part, a decade ago, as expert evidence. This distrust of medical evidence is as a rule much more marked in the jury box than on the bench; as our judges have a better opportunity and are as a rule better fitted to decide who are and who are not capable and honest medical witnesses.

Considering the important part which medical evidence should play in the adjustment of issues at law, the time is certainly ripe for the medical profession to consider the faults for which they are responsible and to take the necessary steps for their correction.

The practice of calling men of eminence in special lines of work as expert witnesses, is ideal in the abstract as such witnesses are presumed to have an exhaustive and authoritative knowledge concerning the subjects upon which they are called to testify, and by their unbiased opinions to aid the court and jury in deciding questions which are beyond ordinary human knowledge.

Thus the rule of law governing expert testimony in this State is "that the testimony of experts is an exception to the general rule which requires that the witness must state facts and not express opinions. In such cases the opinion of the witness may be based upon facts so exclusively within the domain of scientific and professional knowledge, that their significance or force cannot be perceived by the jury, and it is because these facts are of such a character that they cannot be weighed or understood by the jury that the witness is permitted to give an opinion as to what they do or do not indicate. (People vs. Young, 151 N. Y. 218.)

There can be no question that if such evidence as this can be obtained, many of the obstacles to the administration of justice would be removed. It is not then the fault of the ideal but in our method of dealing with it that the difficulty lies.

A grave fault is to be found in the fact that we have no standard for the selection of the expert. It not infrequently happens that witnesses called as experts show only a very superficial knowledge upon the subjects upon which they are called to express opinions, and yet such opinions not infrequently carry greater weight than those of better qualified and more conscientious men. Such witnesses often give as qualifications connections with institutions which furnish them

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with little or no experience, or exaggerate such connections, and the real value of their claims is often difficult or impossible to show to the jury in their true light. Such experts as these, though they do often for a time succeed, soon betray their weakness and pass discredited into oblivion; but they leave behind them a stigma which reacts not only on the honest and capable expert but upon the whole medical profession as well.

Some standard of qualification then is necessary to show that the witness called as an expert has the necessary knowledge before he is allowed to express an opinion on the questions at issue. The real difficulty lies in the question as to who is to be the judge of these qualifications. The courts are not likely to leave the solution of this problem in the hands of the medical profession, even were they at the present time fitted to deal with it which for the following reasons they are not, arising from the jealousy existing between the different schools of medicine and from such factors within them as personal or political interest and the like. It is also a grave doubt if the courts are better qualified to pass on this question, as here a danger arises from personal and political interest, even if our judges had the necessary knowledge of medical men or medical science. The plan of having medical experts appointed by the courts has been and is again being agitated, but it is a matter of grave doubt if it would improve our present method, for the reasons already stated, and from the fact that such a course of procedure would be in defiance of Amendment Six of the Constitution of the United States, which provides "that a person shall have compulsory power in obtaining witnesses in his favor," and by the fact that neither side would be bound by the opinions of experts so selected. Either party would still have the power to call their own experts and thus add to the difficulty arising from conflicting opinions. It requires a much stronger national opinion than exists on this question to alter the national constitution, and therefore the passage of any such law by a State would be futile.

A grave fault which is often apparent in the medical witness is, that he acts in a partisan manner, with the intention of aiding the party in whose interest he is called, but these successors to the mercenaries of ancient days soon become known and discredited; but this attitude is so common that from my twenty years' experience as a witness in court, I can support a statement of one of our justices, that the life of the average medical witness is only about five years. Thus ignorance and bias have done more to discredit medical evidence than anything else. A still graver fault intensifies this situation and that is, that medical witnesses occasionally are found "who paint the picture" deliberately to attain their ends. Medical witnesses, like other witnesses, are human beings, and there are some who have no regard for the sanctity

of an oath. Here the fault lies squarely with the medical profession itself and the problem is worthy of serious consideration. We have practically abolished the Code of Ethics and allow any one to form his own code which is practically anarchy. We have no Appellate Division with power to punish offenders, and it is time that medical societies gave more attention to the general interests of the profession than is done at the present time. It unfortunately happens that many of the worst offenders of this class do not belong to any medical society and cannot be reached through them. We cannot force a doctor to join even his County Society; and even if we could, we could not punish him for an error of opinion, and deliberate misstatement of fact is difficult to prove.

A recent and well known murder case has brought these facts so prominently before the public as to cast a country wide stigma on expert testimony, and almost resulted in the elimination of the defense of insanity in homicide cases; but such a defense is the only one that can be raised in a deliberate and premeditated homicide. In several States it has been proposed to abolish this defense by legislative enactment and this was actually done in the State of Washington, but the law was declared unconstitutional by the Supreme Court of that State.

It was also proposed that instead of "the verdict of not guilty on account of insanity," we adopt the English verdict of "guilty, but insane," and imprison the defendant in an asylum for the same term that he would receive if the crime were not premeditated by a sane person. This method involves the contradiction of declaring a person guilty of a crime which the common law declares he could not be guilty of because he did not know at the time he committed it what he was doing and thus the infant or idiot would be held responsible, and it would be a return to the methods of the dark ages where animals were tried and punished for crime.

It is also urged in favor of this plan, that such a person if he becomes sane, may be and often is released at the pleasure of the Crown; but this is in reality the same as our present method as a justice of the Supreme Court has such power and a justice is just as capable of deciding the question as the Home Secretary.

It is also proposed that the writ of habeas corpus be denied to persons so confined in asylums as the consequence of homicide and thus avoid the scandal of having experts testifying at the trial that the person was insane and a few months later at a hearing that he is now sane; but this is in defiance of Section Seven of the Constitution of the United States which provides that "the privilege of the writ of habeas corpus shall not be suspended, unless in case of rebellion or invasion the public safety may require it."

The report of the Society of Medical Juris-

prudence which considered these questions clearly shows that the mistake of one jury in a murder case and the subsequent attempts to obtain the release of the prisoner does not justify a change in our methods, and that all the proposed changes are unconstitutional.

If then no changes are possible in our methods of obtaining expert testimony, it simply becomes a question of the survival of the fittest, but judging from recent experience, I do not believe that the honest and capable medical witness is in any danger of extinction. If medicine will correct the faults for which it is responsible, then it will be possible for us to nominate men, whom the courts can recognize as authoritative and unbiased witnesses.

The methods of obtaining medical evidence in our courts presents, as all human methods do, certain faults for which the medical witness is not responsible though the blame is usually placed at his door.

The fact that the expert is called by either the plaintiff or defendant and paid by the party calling him, frequently raises the opinion of bias in the minds of the jury; and counsel, no matter how honest the witness, usually endeavor to produce this impression. Again the fact that the counsel of the party calling him only asks such questions as favor his theory of the case, and as the witness can only be crossed on the facts brought out on his direct examination, usually intensifies such an opinion of bias. The contradiction of such evidence obtained in the same way from witnesses called by the opposite party often shows a conflict of opinion which would not exist if it were possible to obtain the evidence from both sides on the same basis. Here the fault clearly is not chargeable to the medical witness but to the fact that the counsel is the sworn mouthpiece of his client and it is his duty to present only such facts as sustain his client's cause. The practice of having medical witnesses coach counsel in the examination of opposing witnesses, unfortunately also gives the impression of bias or partisanship, but until counsel shall have sufficient medical knowledge to do so unaided, this practice must continue if justice is to be secured. The hypothetical question is another well known evil. It is supposed to contain all the evidence produced by one of the contestants and to require an opinion favorable to his theory. That this would turn the medical expert into a mere automaton and render his opinion valueless is recognized and guarded against by the rule already cited in the Young case. Confusion may arise when the expert has to answer two questions by his apparently conflicting answers as when these questions contain facts whose weight can not be perceived by the jury, or two experts may differ as to what a certain state of facts indicate, and unless the reason for this seeming conflict of opinion is made plain by the counsel, which seldom happens or the expert is allowed to

explain, it does tend to discredit medical testimony. Hypothetical questions also may contain facts based on very doubtful testimony and although the medical witness may be aware of this, he must assume them as true, and thus the lawyer puts the responsibility upon the shoulders of the medical man and makes him his tool.

It is evident that this situation is not chargeable to the medical profession but to the methods of our courts and their correction at the present time is beyond our province, and though few minds are capable of grasping both law and medicine in an ordinary lifetime, it is to be hoped that the doctor lawyer will be more common in the future and that he will rather aid in obtaining justice than winning his client's cause.

The greatest difficulty with which the medical witness has to contend is inherent in the subject upon which he is called to testify and is due to the fact that medicine is far from being an exact science, much of its knowledge being purely theoretical or speculative, and this state of fact is recognized by our courts, who hold "that medicine is far from being an exact science, at its best its diagnosis is little better than a guess enlightened by experience. The chances of recovery in a given case are more or less affected by unknown causes and unexpected contingencies, and the wisest physician can do no more than to form an opinion based on a reasonable probability. (Griswold vs. N. Y. C. R. R., 115 N. Y. 61.)

The questions of diagnosis and prognosis are the ones most often in dispute. Few physicians give much special attention to the effects of trauma and especially to its action on the nervous system, and no disease has cast so much discredit, both in and out of court, on our profession as hysteria. Every year cases of hysteria are mistaken for grave organic conditions, and their subsequent wonderful recoveries have not failed to shake popular belief in our knowledge.

One reason for this situation is to be found in the character of our text books as their descriptions are but too often vague, incomplete and theoretical, and really furnish no substantial ground for an opinion in a given case, but their use or rather abuse to support some absurd theory in a case on trial is unfortunately too common. Thus the witness must answer "Yes" if asked the broad statement, if trauma to the head is a cause for epilepsy, and many books confine their statements to such bare statement, and the fact that injury is not a cause for all kinds of epileptic seizures coming on at any time can not be injected into the answer if confined to simple yes or no; and thus it is no wonder that our text books are now rarely seen in our courts.

The situation with the rapid advance of medical science will undoubtedly disappear in the course of time, and especially if medical writers will deal with their subjects in a clear, concise and complete manner. It is evident then that

much of the stigma cast on our medical witnesses cannot in reality be charged to our profession, and if our profession will do its part, the infamy arising from ignorant and designing medical evidence will pass away.

Discussion.

DR. J. B. RANSOM.—I think we have all listened with interest and have been instructed by Dr. Brush's paper. I also think we all realize how extremely difficult it is to establish any method by which medical expert testimony may be had entirely free from the faults with which it has hitherto been encumbered.

First: the most of the proposed plans of dealing with this question cannot be carried into effect because of constitutional prohibitions.

Second: the attitude of the legal profession toward remedial legislation.

Third: the medical profession has not done what it might do in the clearing up of this problem.

This Society in 1895, appointed a committee on medical expert testimony, which continued for four years, and of which I was chairman. The experiences and labor which that committee had during the four years was certainly not of a nature to make one enthusiastic over the possibilities of a remedy for medical expert evils.

We entered upon the work filled and imbued with the idea that much could be done in the way of bettering the methods by which this evidence might be obtained and introduced at trials, but our experience after much research with other medical and legal committees, led us to believe that it was difficult of solution.

So far as I am able to understand the situation, the qualification of a medical expert and ethical restraint are the only direct means by which the medical profession can at this time act in this matter.

First, I believe we can well turn our attention to bring about a standard of qualification for medical experts, just as we have our qualification for the practice of medicine in a general way.

The Constitution may deny us the right to insist upon appointment of all expert witnesses by the court, but it cannot deny us the right to fix the qualification of medical men who propose to give evidence of an expert nature. Certainly if it is legal and constitutional to qualify a man for the practice of medicine, it is equally constitutional to insist upon his qualification when he attempts to practice in the courts. No medical man should be allowed to give medical expert testimony in court trials unless he is duly qualified, and more than that, he should be able to produce a certificate of qualification.

Dr. Brush very pertinently raises the question of who shall be the judge of a man's qualification. Certainly not the courts, for they would be incompetent to judge as to such qualification. Certainly not any particular medical school. The solution of this problem of qualification lies in

the fact that the qualification of anyone seeking to give expert testimony in any branch of medicine, may approximately be determined by a properly constituted examining board, which legislation might provide.

The committee above referred to agreed and reported a bill providing for some degree of qualification for the medical expert; this bill covered the following points:

The applicant for a certificate or license to give medical expert testimony was to apply to the Board of Medical Examiners, offering certain prerequisite qualifications about as follows:

First, reliable evidence to State Board of Medical Examiners, that he was in good standing in the medical profession, and had not less than five years' practice in the special branch or branches in which he desired to qualify as a medical expert, and on passing a prescribed examination in these branches, there was to be issued to him, in the same manner as a license to practice medicine is now issued, a certificate which when filed in the County Clerk's office in the County in which he resided, would make the holder of such certificate eligible to either appointment by the court, or eligible to be called by the defense to give medical expert testimony.

A bill containing these points was introduced by Mr. Kelsey in the Assembly, but killed in the Judiciary Committee.

I believe such a bill enacted into law would be a long step in the direction of correcting many of the evils which now exist in the obtaining of representative, fair and honorable medical expert testimony.

If the profession would unite in insisting upon qualification and certification before an expert witness could be called, they will have opened the way, I believe, to a higher and more consistent type of testimony, and eliminate much that has been unfortunate in medical testimony given in criminal trials in the past.

There is much talk about the appointment of medical experts at any given trial by the courts, but as Dr. Brush suggests it is very questionable as to whether this would prove of much advantage, as the defense would not be obliged to abide by the decision of the court experts, and could call any witness they chose, to say nothing of the court's inability to always select with wisdom such experts.

It is my belief that there never can be worked out a scheme, by which trials for homicide where insanity is made the plea of the defense, that will be satisfactory so long as the question of insanity is decided by a jury composed of lay-citizens, who as a rule are not qualified to pass upon a question of this nature.

The ideal method, it would seem, would be the regular jury trial to determine whether or not the crime was committed by the accused, and if this were proven, and insanity was urged as a defense, this phase of the case could be tried

before a special tribunal composed of trained men in law and medicine, then we might look for decisions which would not only result in justice to the accused, satisfy the community at large, but sustain medical reputation. Here again we are met by the ever present constitutional prohibition, namely, "That a man accused of a crime must be tried by a jury consisting of not less than twelve men, that such jury must be drawn from residents of the county in which the accused committed the crime; neither can a criminal action be taken from the jury and referred to another tribunal."

There is a possibility that the constitutional requirement would be satisfied by the determination of the committing of the crime by jury trial, and that the question of responsibility could be determined by a commission appointed or drawn to hear all evidence both of fact and of an expert nature.

It would seem that if the courts have the right to determine a man's sanity before a trial and after a trial by a commission, that they should be able to do so in the process of trial. If this is not the case, then some changes in both State and Federal constitution must be made to permit the determining of this question of the insanity of an accused by a trained and competent board of men, rather than the ordinary lay-jury. All other means at our command for improvement in the introduction of medical testimony in homicide cases where insanity is made the plea of the defense can only be palliative not corrective.

NERVOUS AND MENTAL SYMPTOMS DUE TO DISTURBED CIRCULATION, WITH ILLUSTRATIVE CASES AND NOTES ON TREATMENT.*

By FRANK H. STEPHENSON, M.D.,
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AFTER several years of careful study and observation I have become convinced that diseases of the circulatory system cause a large proportion of the diseases of the brain and nervous system. During recent years we have recognized pathological changes in the nervous system to be the result of vascular sclerosis, and we now have established a closer relationship between the lesions in these conditions and the symptomatology.

Cardiac disease has long been considered a frequent cause of depressed, emotional, and vague impulsive conditions. Anxieties, suspicions and delusions, develop as cardiac disease advances, with failing compensation, for the weakened and irregular acting heart fails to properly supply the brain and spinal cord with nutrition and an even circulation. That this state should develop into a depressive psychosis is not strange, nor a great

step, for the proper functions of the brain cannot be performed nor its mental balance secured unless there is a sufficient and even supply of blood of a proper quality.

Sometimes patients with cardiac trouble pass through periods of fear, emotional excitement and insomnia. They lose flesh and strength and become profoundly anæmic. They are great sufferers from dyspnea and seem almost at death's door. After a period of complete rest in bed, a carefully regulated diet, and medication, the cardiac symptoms, as well as the nervous paroxysms and mental excitement subside, and the patients often become mentally normal.

Two interesting cases recently came under my observation with the following histories: Mr. O—, German, age thirty-five years, no history of syphilis or other illness except rheumatism, no arteriosclerosis nor neurological symptoms; physical examination revealed marked cardiac hypertrophy and dilatation, aortic regurgitation and failing compensation, some albumen, no casts. The principal distress is dyspnea and delusions of fear that people will injure him. These delusions and a semi-confusional state are increased in extent during the period of dyspnea and precordial distress. At intervals, when comfortable, he can correct his confused ideas, become less disoriented and more easily cared for, and can answer questions quite intelligibly.

CASE 2.—Mr. S—, aged fifty-three, German, occupation bookkeeper; no history of syphilis or other serious illness except attacks of rheumatism; a man of good intelligence, B. P. 150, P. 110. Physical examination revealed cardiac hypertrophy. Apex beat made out in sixth interspace. Impulse very strong on palpation, mitral murmurs loud and blowing, displacing the first sound and carried to the extreme left; aortic and pulmonary areas clear, dyspnea marked, extremely so on exertion, excessive cough disturbs him night and day; pupils irregular, the right somewhat larger, sluggish reaction to light, but respond to accommodation; good co-ordination. knee, biceps and elbow jerks exaggerated; no facial tremors, test words distinct, stereognostic sense normal. When quiet and at his best, he realizes he is ill, but is confused. When excited or restless he is disoriented, exhausted, and has terrifying dreams. The pulse frequently becomes greatly increased in action. When these paroxysms subside, he still remains in a semi-delirious state, rambling in conversation. On account of the serious lesions and failing compensation, but little improvement can be expected in this case, though the patient has improved under enforced rest, careful diet, and digellen given in XII m. doses, at eight hour intervals.

In patients with aortic obstructive lesions and those with mitral regurgitant murmurs, we often have diminished blood pressure and irregular circulation. Temporary anæmia, with failing cerebral nutrition, follows, causing symptomatic

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

tremors, paræsthesias, head pain, vertigo, insomnia, cardiac palpitation and epileptoid seizures. In hyperæmic conditions, in people of apoplectic habit, flashes of heat and zig zag lines before the eyes, vertigo and numb sensations frequently recur, keeping these patients in a state of anxiety and fear, limiting psychic power and volitional processes.

I have under my care several over-taxed professional and business men who have no apparent arterial disease, but weak hearts with slow pulse, B. P. averaging 110. When fatigued or suffering from gastro-intestinal disturbances, they often develop severe headache, and head pressure, faintness and vertigo. The pulse would drop into the 40's, with marked arrhythmia and present an alarming picture. Absolute quiet, with the head low and strong heart tonics hypodermically given, (as the stomach cannot be depended upon in this desperate condition) also hot water bottles about the chest, abdomen and head, have worked admirably in these cases, which were doubtless an acute cerebral anæmia relieved by increasing blood pressure.

As we study the pathological changes in the greater number of nervous diseases, the neuron alone seems rarely the only abnormal change of structure. There is almost invariably some arterial change at the seat of the lesion or in the more remote source of blood supply, altering the amount of blood or changing the quality. Among the causes for these changes are syphilis, gout, rheumatism, typhoid and other fevers, acute infections, also thyroid and kidney diseases. Among the various nerve diseases dependent upon circulatory troubles, we may mention chorea, associated with endocarditis, polyneuritis, Landry's paralysis, and paralysis agitans, where we find a peri-vascular sclerosis in the central horns, also tic douloureux often accompanied by arteriosclerosis in the gasserian ganglia, with high tension.

The various scleroses of the spinal cord depend primarily upon anæmia with diffused inflammation of various tracts resembling tabes or spastic paralysis. Among other diseases often primarily due to derangements of the circulatory system are myelitis, Raynaud's disease, erythromelalgia, exophthalmic goitre, also brain tumors and abscesses developing in connection with the vascular structure of the meninges, as well as the irregular paralyzes of the aged, developing from arteriosclerosis, artheroma, or thrombus of the spinal vessels.

Aneurisms. The most probable etiological factor leading up to aneurism of the brain is arteriosclerosis. Aneurisms are often preceded by syphilis, gout, alcoholism, or nephritis. They are usually found in the pons and base and are often symptomless until rupture occurs, when they are commonly diagnosed as apoplexy. According to Charcot there is a peri-arteritis-simplex leading to miliary aneurism, the disease be-

ing primarily in the adventitia and extending to other coats of the artery, resulting in degenerative areas which soften and dilate into aneurisms. The murmur of bruit of aneurisms is sometimes heard by physician and patient and is usually of the basilar artery, controllable by external pressure. The sound is sometimes heard near the dilatation, but this cannot be depended upon, as it may be transferred.

Tinnitus is a distressing symptom often caused by changes in the vascular supply of the brain. According to Wiley it is due to variations in the quantity, quality, and pressure of the blood, the excitant causes often being fright, fatigue and debility. The sounds are variously described as whistling, cracking, ringing or buzzing. We frequently meet tinnitus in connection with nephritis and high arterial pressure. Pressure of the distended brain from cerebral vessel congestion is also thought to crowd the tissues against the inner table of the skull, revealing a wave-like murmur. It is an early symptom of plethora preceding apoplexy.

The symptoms of the various cerebral apoplexies, such as hemorrhages, thromboses and embolism, should be better understood by the general medical man, so that more intelligent medication may be early employed. The etiology differs and requires opposite methods of treatment. The two usual symptoms of apoplexy are loss of consciousness and hemiplegia. With hemorrhage, we have a weakened vessel, high blood pressure and high tension pulse, with arteriosclerosis. The hemorrhage usually occurs during a period of physical activity. Blood pressure must be lowered and for this nothing seems to take the place of *veratrum viride*, *aconite* and sedatives. Rarely have I seen venesection accomplish any great benefit.

Apoplexy from embolism often comes on during exercise or strain. We find the heart irregular in action, high blood pressure and short periods of unconsciousness. There is usually a previous rheumatic history. Here we also resort to sedatives, rest, with the head low, and attention to the elimination.

Cerebral thrombosis means, on the contrary, diseased, thickened blood vessels, low pressure, low, slow pulse, and often a history of syphilis. These seizures often occur in men under fifty years of age, who have had transient attacks of numbness and weakness, headaches and torpor, preceding this severe attack. Blood pressure must be increased, the heart being kept under cardiac stimulants and tonics. Usually the iodides and mercurials, arsenic and iron are indicated. Many patients come to us who are border line cases, having the proper conditions and some of the early suggestions of an attack. Many of these attacks recur at quite regular intervals and are often successfully retarded and rendered less severe under appropriate treatment. These cases present opportunities for a vast amount of

prophylactic work in nervous and mental diseases.

We have an ever increasing variety of nervous and mental symptoms attributed to arteriosclerosis. In many of these cases the disease is so far advanced before they come under treatment that little can be done to improve their condition, except in the way of temporary relief in arresting serious convulsive seizures and in delaying the fatal hemorrhage or terminal dementia. Thus we see the need of educating our patients in earlier life regarding the possibilities of arteriosclerosis before them in later years. This is specially necessary in families where there seems to be a hereditary tendency to sclerosis. One interesting case recently under my care for preventive treatment gave a history of eight ancestors on both maternal and paternal sides who had died or suffered from paralysis agitans or apoplexy.

In more advanced sclerosis I have seen marked deterioration of moral sense where elderly men had made assaults upon young girls and had to be placed under restraint. In some of these cases the physical signs of sclerosis have not been well-marked, the patients have been brought before the court and their proper disposal has been accomplished with difficulty. Personal characteristics are often exaggerated, such as jealousy, egotism, and penuriousness. In advanced cases the whirling and uncertain head sensation, pressure and noises in the ears often cause the patient to say he will surely lose his reason, if the sensations continue. Sometimes a patient is driven to attempt suicide and often to accomplish it. These symptoms are often preceded by a hard, rapid pulse with varying degrees of arrhythmia, increased blood pressure, flushed face, contracted pupil, a sharp, piercing expression of the eye, facial tremors and great agitation. In other cases, at quite regular intervals, epileptoid seizures occur, followed by a dazed, weakened condition, and slight aphasias. The patient later is disoriented and has hallucinations and delusions. Between these exaggerated periods patients are often so well that they enter into the regular family life, and it is very hard to place them in an institution, but at intervals they are very trying and almost destroy all home comfort.

Mrs. F—, aged 68 years, American, woman of good health until about fifty years of age, when she developed ovarian and uterine disease requiring removal of those organs. No malignancy. She made a good recovery but began developing rheumatism and became very nervous. She came under my care two years ago, at the age of sixty-six. Her symptoms were nervousness, insomnia, vertigo, with whirling sensation which almost threw her to the floor, dizziness, when turning in bed, very sharp frontal, head pain and marked irritability. Physical examination revealed a rapid, hard and irregular pulse,

heart sounds exaggerated, but no distinct murmur, blood pressure 220, hard, tortuous arteries, joints swollen and nodular. The urinary analysis indicated specific gravity 1010, urea one-half per cent., reaction acid, indican excessive, no albumen or sugar. The microscope showed calcium oxalates and urates, but no casts.

At intervals of a few weeks she had extreme vertigo, intense head pain, flushed face, pulse 120, and suggested a pre-apoplectic condition. She heard voices accusing her of wrong acts and was tremulous and in great fear. Once she threw herself into a cistern, but was rescued, and at another time, drank a solution of carbolic acid. Fortunately, it was diluted and a physician near at hand, so no serious results followed. At these times she was disoriented. These attacks were relieved by reducing blood pressure to about 170, the use of free purgatives, sedatives and rest. All mental symptoms subsided completely and she resumed her regular home life. When blood pressure is brought below 170, she is not so comfortable, this being normal for her general condition.

Mr. H—, American, aged 48 years, occupation bookkeeper, a man of excellent habits, no history of syphilis or any serious illness, marked family history of malignancy. Returning from an active vacation, he became dizzy, then came a short period of unconsciousness, followed by aphasia, no paralysis of the extremities. The aphasia was not complete and in a few days had largely passed away, the patient remaining weak physically and had difficulty in recalling words. The urine was reported to have been fairly normal by a careful physician who treated him for several months.

In several weeks he had a convulsive seizure, followed by excessive vomiting and confusion, the latter continuing for three or four days. No other symptom except general prostration. These attacks recurred once in about seven weeks, the regularity being so marked that they were looked for by his wife. This history continued for one year, with no indication of albumen or casts, nor any special improvement in the patient's condition.

I then saw the case, found the blood pressure 220, pulse 90, full, hard, but no hardened condition of the blood vessels observable. The condition and history suggested an atheromatous state, possibly due primarily to malignancy. Under the use of iodides, nitrites and iron, continued for three weeks out of each month, and during the fourth week omitting these remedies and giving calomel, also by the use of high frequency electricity, the patient has shown marked improvement, the intervals between epileptoid seizures increasing from seven weeks to six months.

Summary.

Thus we find (1) that both organic nervous and mental diseases can find their sources in disturbed circulation, quality and quantity of blood

depending upon diseases of the heart, arterial, venous and capillary systems.

(2) That people aged about 50 years should have frequent examination made of the circulatory system, also frequent chemical and microscopic urinary examinations. They should be instructed regarding the probability of developing arteriosclerosis and the diseases and dangers it leads to. They should be informed regarding the regulation of their diet, exercise, rest, and elimination. As a preventive measure, they should be given some form of iodine, preferably sajoidin or iodalbumin, which are borne by most sensitive stomachs. Almost monthly a mild mercurial purge should be given. The tension should be recorded and if increased beyond the normal average for the age of the patient, the probable cause of this increase should be sought for. In urinary analysis, first, indican is usually revealed, showing deficient action of the liver, pancreas and intestinal tract; second, in the amount of urea eliminated and its relation to the specific gravity, and third, the presence of sugar, albumen and casts.

In observing this expectant regime I have found high frequency electrical treatments a great adjuvant in the care of advanced cases of arteriosclerosis, and especially so in warding off epileptoid seizures, some of which recurred at quite regular intervals until placed under this plan of treatment.

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Discussion.

Dr. B. C. LOVELAND.—From the text if not from the title it would appear that the writer has had in mind the practical impossibility of differentiating between the symptoms produced by excess or diminution of the blood stream, *i. e.*, simple changes or "disturbances of the circulation,"—and those produced by alterations in the quality of the blood.

As a matter of fact it is a very rare thing to find an alteration in the circulation, other than a purely mechanical one, which is not caused by some toxic substance in the blood, and which may be also responsible for the nervous and mental symptoms.

The disturbances due to a change in the quantity of blood pushed through the arteries

would logically be over-nourishment or under-nourishment, *stimulation* or *exhaustion*.

These we do meet with, but a large variety of the symptoms attributed to altered circulation find their *remote* cause in the personal peculiarity of the patient. Hence we find fears, or phobias, depressions, emotional states, etc., where there is no mechanical impediment to the circulation like valvular heart or aortic disease, as well as in those conditions.

There can be no doubt that in localized sclerotic areas we have the cause of many mental peculiarities incident to age, and I think the writer's suggestion of a closer differentiation between hæmorrhage and thrombus in the brain as a basis for treatment might be elaborated further. We frequently meet with temporary aphasia, unconscious spells, periods of disorientation, and hemiplegia of a transient character, which occur in the senile who are not plethoric, have no high blood pressure, and no evidence of unusual cerebral congestion, and these are best treated by the recumbent posture, arterial dilators, and often heart tonics, while the plethoric, apoplectic, if seen in the acute attack, is best kept in a sitting or semi-recumbent posture, and a partial ligation of the extremities, hot foot baths, or phlebotomy might help to limit the extent of the hæmorrhage.

The toxic condition, as shown in the urine, the arterial tension, the regulation of the patient's life habits, so as to conserve life as long as possible in an efficient state, furnish most fruitful fields for study, when we consider that a large majority of people who die after the fiftieth year from some cause directly related to arterial degeneration.

"AFTER TEN YEARS."*

A REVIEW OF EXPERIENCE WITH GASTRIC NEURASTHENIA, AND THE ABDOMINAL PTOSIS.

By BRADFORD C. LOVELAND, M.D.,
SYRACUSE, N. Y.

IT has been said that anything in the practise of medicine which is ten years old is out of date, and to be laid aside as a back number. And true it is that new discoveries and new methods of treatment, both medical and surgical, come trooping in on us at a rate that can only be realized by stopping a few moments and reviewing the past, but it will not do to stop too long, lest we be overwhelmed and lost in the avalanche of progress.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

However, we must not forget that certain principles and facts remain, which at times seem to be lost sight of by the rank and file of our profession, while their attention is absorbed by some spectacular operation or experimental method which may not survive longer than a season or two.

About ten years ago the writer published a paper entitled "The Clinical Value and Treatment of Atonic Dilatation of the Stomach" (*New York Medical Journal*, October 16, 1902). This paper was based on experience, and most of it, unlike much of medical literature ten years old, will still stand today.

The writer was prompted to this review of experience partly by hearing a paper recently in which were reported two cases of chronic neurasthenia, with all the usual train of distresses, who had tried various medical methods with no benefit, and whose symptoms were attributed to intestinal toxæmia, from a festooned or angulated

colon, and which were much benefitted by removing the sagged portion of intestine; and partly by the chance that brought a patient to my office a short time ago, whose case had furnished part of the material for my paper of ten years ago.

At that time she was a chronic neurasthenic with general abdominal ptosis, that had resisted a great variety of medical, gynæcologic and ophthalmologic treatment, and was a slave to headache, constipation, flatulent dyspepsia, faint spells and agorophobia. She had not left the house alone in eighteen months. At this time she consulted me for a neuritis in one arm, and I asked the privilege of making an examination of the abdominal organs to compare with my chart of eleven years previous. She said she thought she was all right so far as that region was concerned, as she had had no trouble with her stomach, or constipation, or dysmenorrhœa, since she left my care, and only an occasional headache, but she did not object to the examination. I found the stomach in practically normal position, and the right kidney just palpable. In fact, about as well as when she was discharged over ten years ago, as accompanying diagram will indicate.

The position of the abdominal organs has received a large share of attention from both physicians and surgeons during the last few years, and the endeavor to correct the evils which accompany the abdominal ptoses has been approached from various standpoints according to the different vantage ground from which the attack has been made.

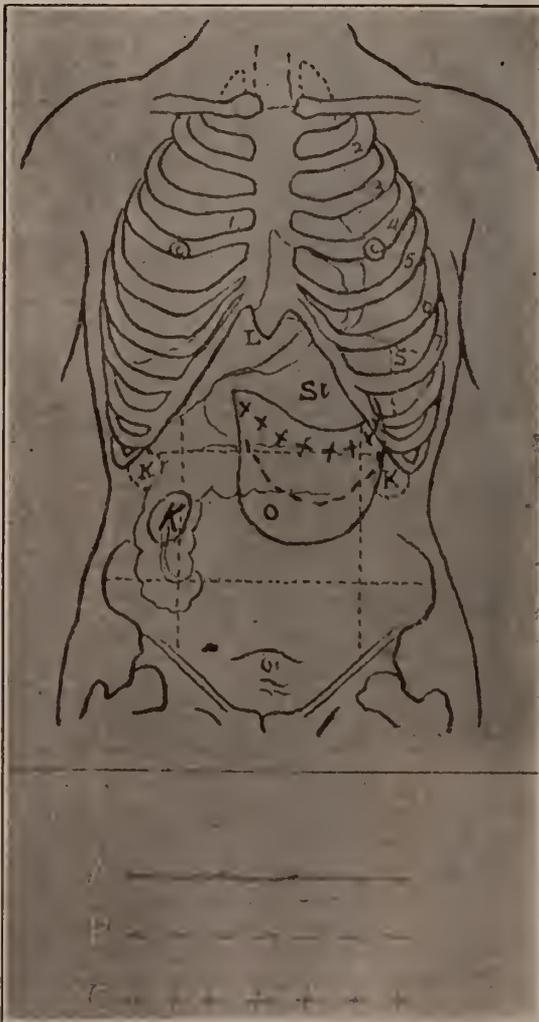
The surgeon has done his best to replace and render immovable the wandering kidney, has taken reefs in the dilated and sagged stomach, or made a new outlet by gastroenterostomy, has tried to secure a better external support by abbreviating the abdominal muscles, and more recently has removed the sagging intestine to render stasis of its contents and absorption of toxic materials impossible, all with a success which, to say the least, has not been all that could be desired, especially when the test of time has been applied.

The medical man has dieted his patients with a small amount of concentrated food and reduced the amount of fluid with the hope, fruitless in most cases, that the stomach would shrink down to the size of its content. He has tried supports, corsets, bandages, etc., with occasional relief, but not cure.

The laboratory specialist has sought a cause for these troubles in the composition of the gastric secretion, but frequently it has shown no deviation from the normal.

But I shall not lengthen this paper by giving all the theories and methods which have found vogue.

There has been more stress of late placed on the congenital defect, or inherited weakness in this



CASE III.—A, November 30, 1900; B, December 18, 1900; C, March 2, 1901. From case published October 18, 1902. Outline of Stomach the same as indicated at C, March 2, 1901. Right kidney is just palpable.

class of persons, and with considerable reason, yet this should not discourage us too much, for we are all aware of the possibilities of health which often lie ahead of the patients with tuberculous parentage, and we do not hesitate to work for their upbuilding, and expect a fair degree of success.

The main fault to be found with the methods referred to are, first, a failure to appreciate the underlying neurasthenic state with its muscular as well as nervous weakness, and to make this the basis for individual study and individual treatment.

Second, the endeavor to reach a quick cure for a chronic weakness through surgery; and, third, the resort to artificial supports, which is a confession of the belief that cure is impossible and not to be expected.

Treatment should be founded on a thorough understanding of the condition, a careful study of the individual and his habits, and environment, and should be administered with all the optimism at our command to ensure the best results.

The causes of this condition begin with heredity, that is to say, the larger portion of cases are by inheritance of the neurasthenic type, highly sensitive, slight built people, who are ambitious, quick acting, easily encouraged, and about as easily discouraged, and who are prone to select an indoor occupation, which involves a drain on the mental and emotional faculties, and are often, like the tuberculous, the product of the congested city, and moderate or poor circumstances.

The next cause, rapid eating or overfilling the stomach, is very common to early childhood, in fact, so common as to be almost considered natural animal instinct. Few will take exception to this statement, for if we look at the habits of the lower animals we will find that with the exception of the ruminating group, "bolting" the food is the rule.

So common is dilatation of the stomach with ptosis in small children that most of our adults would be found in the same condition if spontaneous return to the normal adult condition did not occur in most cases, and I think it likely that practically all could be brought to the normal if the condition was discovered and proper regimen enforced, and proper environment provided.

Another factor to be mentioned among the causes should be *age*. The extreme frequency of this condition in young children has been referred to, but as a matter of fact, it is seldom brought to the notice of the physician till later in life, except by accident or in investigating some other trouble. The period between fourteen and twenty-four years is most prolific in developing this condition, because during these years the youth begins to assume the burdens and cares of adult life, and latent neurasthenia, often congenital, and abdominal ptoses which have been unobserved from childhood, now become appar-

ent under the strain of added work and worry. Another cause to be enumerated should be frequent child bearing, but while this is true of certain cases, and often obstinate ones, they differ from the others in this, they often have a greater degree of ptosis with less symptoms than those who have not borne children.

Another observation worthy of notice is that the condition is *very* common among unmarried women and those who have not borne children, and even among a certain neurasthenic type of men, and I am not at all sure but the ptosis of abdominal and pelvic organs in many childless married women is accountable for their sterility. These cases often belong to the hereditary type, and the whole picture may be one of race degeneration.

The symptoms, largely those of neurasthenia, are so generally recognized that I will not prolong the paper by describing them, simply stating that the history of the patient often is sufficient to direct our attention to the condition before examination.

The symptoms may be explained partly by the mechanical displacement and consequent traction on nerves which, while not carrying the ordinary tactile sensation, still may excite reflex disturbance, and, secondly, by the lack of tone or elasticity, resulting in a diminished intra-intestinal tension or pressure, which allows the accumulation of gases, and stagnation of the intestinal contents to such a degree as to favor fermentation and auto-intoxication.

Both these are augmented by the habit of invalidism which becomes a part of so many chronic disorders.

The treatment which has been most successful in my hands, while differing in different cases, has had as a central idea a better state of nutrition, both general and local, and is a system or regime, rather than a course of medication, for we all know that medicine has produced no specific for neurasthenia.

First.—The various physiologic functions of the body must receive careful study, and particularly the excretory functions encouraged, for there is little doubt that auto-intoxication can best account for many of the bad feelings, and also through its effect on the sympathetic nerves may have a powerful effect on the circulation, and that quality of tissue we call tone or elasticity. This encouragement of the excretions is best accomplished by prescribing the diet, both food and drink. Two quarts of water, or at times more, per day, foods low in nitrogen and abundant in moisture, salts, and soft, pulpy material, such as potatoes, carrots, string beans, celery, cooked or raw, lettuce, endive, chard, beet top or other greens, and such fruits as apples, peaches, pears, bananas (better cooked), ripe olives, oranges, dates, prunes, etc., avoiding in the main sharp acids, and berries having small seeds; meat in moderation, and no salted or

preserved meats. This plan of diet, with individual variations, has been most helpful, and will often be found sufficient to overcome the constipation so common with this disorder with little or no drugs.

Second.—The patient's habits of exercise, occupation, recreation, of attention to the bodily functions, his environment, both home and business, require study, and such regulating as to make them contribute to his health; particularly should we emphasize open air exercise, time and deliberation at meals, regular attention to the bowels, and regular hours for sleep and rest.

Third.—Bathing, calisthenics, and electricity.

A morning cool sponge bath, general, or at least over the chest and abdomen, temperature from 70 degrees down to that of tap water, short in duration, and to be followed by calisthenics adapted to increasing the strength of the abdominal muscles and the abdominal circulation.

A sample of such exercises would be as follows: Erect posture, flex and extend arms—flex and extend legs—bend forward and backward—bend one side and then the other—squat down and get up—lie down—elevate one foot and then the other as high as possible, keeping the knee straight—deep breathing while the arms are moved as follows: complete expiration while hands are down at sides, slowly inspire as hands are raised up and reached out beyond the head as far as possible, exhale while the hands are returned to their former position; use the nose for both inspiration and expiration. The number of each should be prescribed with due consideration to the patient's strength, and increased from time to time. Often four each will be found sufficient to begin with, and one each may be added every fourth or fifth day till the exercise would consume ten or twelve minutes.

There are occasional patients who are so far reduced that they cannot take sufficient exercise at the expense of their own volition, where properly applied massage is most helpful, but in such cases the physician should see and know what the masseur is doing, for his judgment is much more to be trusted than that of the masseur.

The form and mode of administering electricity most useful is as follows: Galvanic, negative to base of spine, positive to neck as high as possible, from 6 to 10 milliamperes, slowly moving the electrode down to the prominent vertebra or a little lower, time about four minutes; then change to the Faradic current and apply over the abdomen and lower portion of chest about to the line of the diaphragm, and move the electrode around slowly from right to left, following in a general way the direction of the colon; duration of treatment about eight or ten minutes, and of such strength as to produce mus-

cular contraction when it is passed over the various contractile points in the abdominal muscles. In some cases where constipation is obstinate, the negative electrode should be introduced into the rectum, the other directions being the same, and special conditions may indicate the wisdom of some other variations.

The above treatment should be given three times a week at first and later less frequently. There is no doubt of the helpfulness of these treatments, and besides, they bring the patient to the doctor's office frequently enough so that he can keep in touch with his condition, and can also find out how the patient is carrying out his instructions. These visits also furnish the physician an opportunity to give that psychic help by way of encouragement and inspiration that this class of patients need so much, and the importance of which can hardly be overestimated.

Medicines.—Most of these patients have "lived upon tonics" and laxatives for years, and their lives have been a burden, and they often lose faith entirely in the curative possibilities of medicine, but become enslaved to the temporary relief which laxatives give them, and are fortunate if that is all that they get to be dependent on.

Yet, in many instances medicines should not be entirely thrown aside, though in some cases they could be, and a mild chologogue like protoiodide of mercury gr. $\frac{1}{8}$, two or three times a day, a tonic for the stomach such as a tablet containing ext. nux vomica gr. $\frac{1}{4}$, pulv. rhubarb, gr. i, and soda bicarb, gr. i, after each meal; a few grains of granulated sodium phosphate in a glass of hot water each morning for a time, or small doses of cascara sagrada at night may be necessary in certain constipated cases while the hygienic methods described are getting under way. No laxative should be given in doses which would produce an imperative evacuation, but just sufficient dose to enable the patient to secure an evacuation with the aid of the hygienic helps mentioned.

This method, with such variations as individual cases demanded, has been used in several hundred cases, many of which were of years' standing and had resisted the treatment of many physicians, with results that were very satisfactory to all concerned, even if the treatment did require some time and patience, and several at least have stood the test of remaining well so far as this class of troubles are concerned for ten years or more, which fact encouraged me to present the subject again.

The key words to success in this very obstinate class of cases are *individualized method, optimism, and persistence.*

FURTHER IMMUNOLOGICAL STUDIES IN CHRONIC PNEUMOCOCCUS ENDOCARDITIS.*

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THE picture of that form of endocarditis which begins insidiously from no associated severe infection, with mild symptoms at first but later developing a septic temperature, and which runs a long almost invariably fatal course in from three to fourteen months, is quite generally recognized clinically, but that it is almost always due to bacteria with such characteristic features as to enable one to make a diagnosis and nearly always a correct prognosis from a study of the organisms obtained by blood culture is not yet generally known.

The organisms obtained are variously designated. Schottmüller¹ names them "streptococcus mitis or viridans," Horder² "saprophytic streptococci," Hastings, "streptococcus tenuans," and Libman³ recently suggests that they be named the "endocarditis coccus." There is no question but that these observers are dealing with the same micro-organism.

Culturally and morphologically the strains as found in these cases resemble pneumococci more than streptococci. Thus on blood agar plates the various strains produce a variable amount of green and never a primary hemolysis. Most strains ferment inulin. The chains are made up of distinct diplococci. When first isolated the growth is very dry and has a marked tendency to adhere tightly to surface of agar, to hang together and to grow in clumps and often in very long chains in broth just as they do in the vegetations. These properties are more marked in the strains obtained from the cases which run a more chronic course. Cultivation on artificial media especially under anaerobic conditions and also after animal passage causes the tendency to adhere to the surface and the formation of clumps to disappear. They now often grow exactly as do pneumococci which have been cultivated on artificial media for a long time. That the property of growing in clumps is largely responsible for the ability of these strains to produce endocarditis has seemed certain from my former studies (*Jour. Inf. Dis.* 1909, 6, 245; 1910, 7, 429 and 411) because endocarditis developed only in the rabbits following intravenous injections before these properties had disappeared.* The inability to produce endocarditis, after this property has disappeared, is not due to a loss of

what little "virulence" they possess in the beginning because their virulence can be increased by animal passage to the point where the animal dies of a septicæmia or a pneumonia but without an endocarditis, the organisms now resembling typical virulent pneumococci.

Similar observations have been made since on five other strains from endocarditis, on one strain of a typical "streptococcus viridans" from the throat, and on one strain from empyema pus; hence I feel that these organisms should be designated as modified pneumococci. The details of this study and experimental proof of how endocarditis begins will appear in a forthcoming number of the *Journal of Infectious Diseases*. I will state here that the specimens presented, together with other facts show that the way these organisms produce endocarditis is by producing first an embolic hemorrhage which serves as a culture medium, and growth begins before the leucocytes gain entrance to destroy the bacterial clump, and the vegetation is the result.

The patient on whom the following observations were made was admitted to the service of Dr. Sippy (to whom I am indebted for the opportunity of studying the case) at the Presbyterian Hospital, December 12, 1911. Liquor dealer, age 52, had enjoyed perfect health for years except for an "irritable throat" and some slight gastrointestinal disturbances. Early in November he had three attacks of severe pain in the abdomen which extended across the epigastric region and around into his back. The last attack was the most severe, lasting three hours, the pain was excruciating and relieved by morphine. In the last attack the pain extended around the whole body in a circle. In his attack he felt chilly but did not have a distinct chill. Since then he had no pain but grew gradually weaker, became slightly jaundiced and had some fever every day. On entrance into the hospital there was found a slight but unmistakable icterus and pallor, definite tenderness in the region of the gall bladder, a palpable spleen, a slightly hypertrophied heart, and a mitral regurgitation. A blood examination showed 78 per cent hemoglobin, 4,200,000 reds and 12,000 whites. A single blood culture proved negative, urinalysis showed a normal urine. An exploration of the gall bladder was advised by Dr. Sippy, in spite of the fact that a malignant endocarditis was suspected so strongly that the patient was told that the operation might not relieve him. There was found a greatly thickened, shrunken, and adherent gall bladder from which there exuded normal appearing bile and not pus. This showed definitely that the attacks of pain were due to a cholecystitis, but the temperature was not relieved by drainage of the gall bladder. The question whether the cholecystitis had anything to do with the development of the endocarditis or vice versa is uncertain. It is likely, however, that the endocarditis was present earlier on ac-

* Read at the annual meeting of the Medical Society of the State of New York, April 17, 1912.

¹ München Med. Wchnschr., 1910, VII, p. 617.

² Quart. Jr. Med., 1909, II, p. 289.

³ Proc. N. Y. Path Soc, 1911, XV, p. 118.

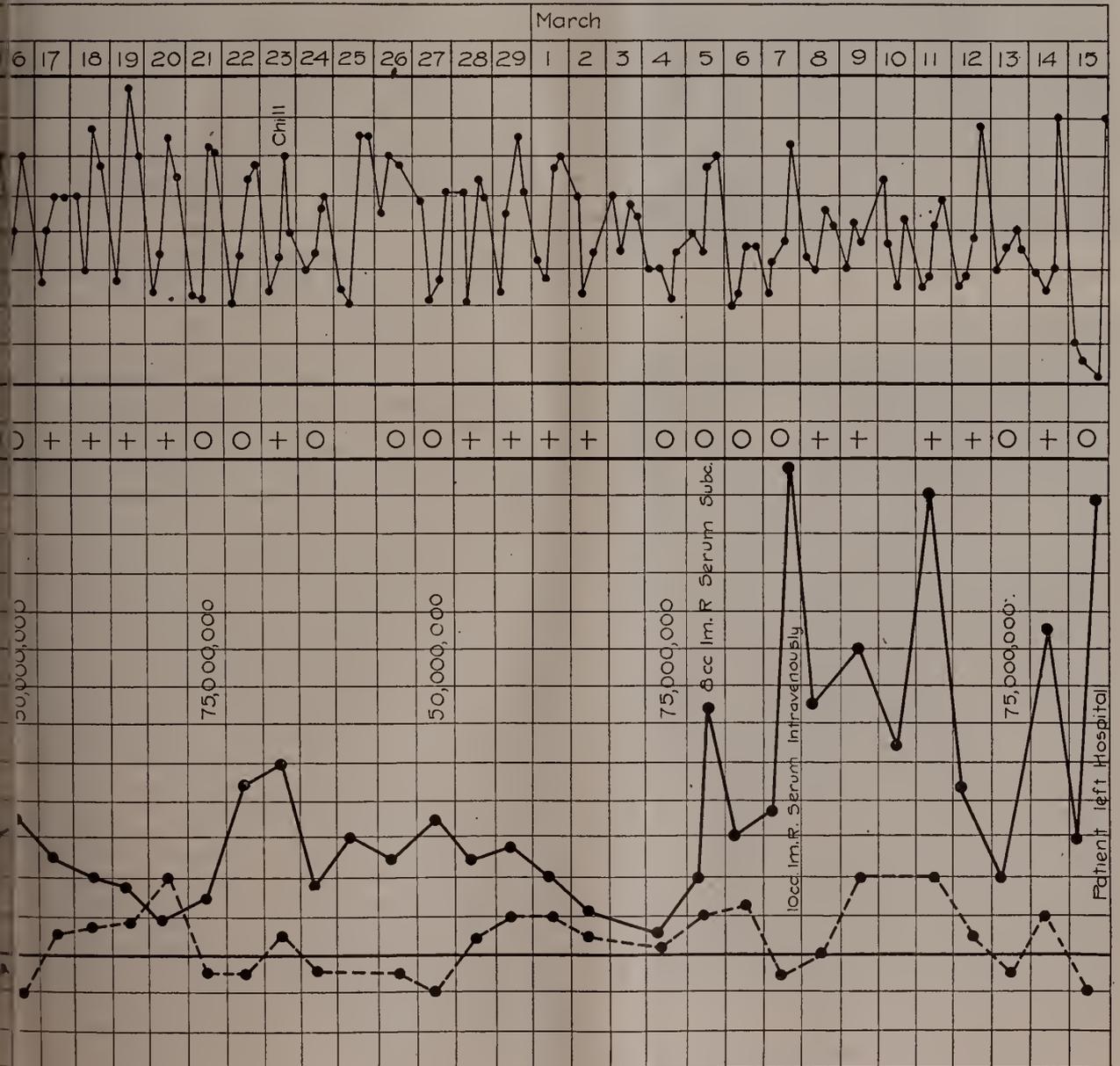
* This same feature is no doubt responsible for the peculiar lesions in the glomeruli described by Gaskell (*Jour. Path. and Bact.*, 1912, XVI, p. 287), as "embolic focal nephritis" and more recently by Baehr (*Jour. Exp. Med.*, 1912, XV, p. 30), in cases of this type of endocarditis.

the vein at the elbow in five instances, and was found to be reliable. The importance of plating out into agar some of the blood in making blood cultures where endocarditis is suspected is illustrated by the results obtained in eleven control tests in which .5 cc. of blood was planted into 5 cc. broth and at the same time plated out into agar. Four of the former remained sterile when the plate method showed from 23 to 78 colonies.

Phagocytic and Pneumococcal Tests.—The phagocytic experiments were made in the usual way by determining the average number of bacteria taken up per leucocyte in the patient's whole blood and in normal blood. Likewise, the destructive power was tested in a separate series of pipettes by mixing equal parts of the washed leucocytes, serum and the suspension of pneumococci used in the phagocytic mixtures, diluted

one hundred times. Immediate and 24 hour blood agar plates were made. When destruction in the patient's blood was equal to or above that of normal blood plus, when less zero, is put down in the chart. Smears were also made of phagocytic mixtures at the end of 18 to 24 hours and studied microscopically; the results here correspond closely to the plate method.

In a previous paper I have shown that destruction of bacteria within the circulation is associated with a corresponding greater intoxication as manifested by greater subjective symptoms and a higher fever. This is often proportionate to the number of bacteria destroyed. It makes no difference whether this occurs from natural causes or the result of the injection of heat killed bacteria, of normal serum, and as shown here of immune rabbit serum. Out of



eight vaccinations (see chart) five (25 to 50 millions) were followed by a drop in the number of bacteria in the circulating blood and an increase of the destructive power which lasted from two to five days. Three larger injections (75 millions) were followed by a rise in bacteria. After each instance of the former the patient had a definite rise in temperature; whereas after the latter, when no active destruction of bacteria occurred, the temperature following the vaccination remained lower than the day previous and the patient felt correspondingly better. From the condition of the patient for a given day it was often possible to predict whether the bacterial count would be higher or lower. When he expressed himself as having felt very well the bacterial count that morning showed either no diminution or even an increase, while on the other hand when he expressed himself as having had a miserable day or night, the temperature always being higher, the bacterial count showed a diminution over what it was the day previously. Thus in 23 instances the temperature was higher during those days when the bacterial count the following morning showed a drop. This point is brought out still better on the three days (March 5, 7, and 15) when two bacterial counts were made on the same day. The temperature on each of these days rose very little between 8 A. M. and 4 P. M., while the bacteria were multiplying rapidly, but rose to a higher point during the late evening or night while the bacteria were being destroyed.

In my previous papers experimental evidence was produced in favor of the view that the destruction of the bacteria in these infections is due to phagocytosis and intraleucocytic digestion, that the opsonification and the taking up of the bacteria is no proof that they will be destroyed, and that there is present in normal serum a substance independent of opsonin which acts upon leucocytes in such a way as to favor intraleucocytic digestion of bacteria. This substance is absent in the serum from cases of endocarditis at the time when the destructive power is below normal. Similar results were obtained in the present study.

A glance at the chart shows that on the days when the patient's blood destroyed his own organism *in vitro* as well or better than comparable normal blood the phagocytic power was either normal or above, but never below normal. When the phagocytic power was below normal (16 times) then the destructive power was also less than that of normal blood. While in 10 instances when the phagocytic power is normal or above the destructive power nevertheless was below normal. Thus indicating here as was found to be the case in my former studies that the taking up of bacteria or a good phagocytic power of the blood does not always mean a corresponding destruction.

The benefits of the smaller vaccinations (25 to

50 millions) as measured by the bacterial count cannot be questioned because they were followed by a reduction in the number of bacteria and activation of the destructive power of the blood, and clinically they seemed to do some good, but the patient finally died from exhaustion.

The rabbit serum which was injected on two occasions was prepared by injecting repeatedly large doses (100 to 300 billion) of the heat killed bacteria intravenously into rabbits and then bleeding them from the heart. Clinically and as shown in the chart the larger vaccinations and the immune serum seem to have had an untoward effect because the total number of bacteria was greater following their use even though there was a transient drop after the serum injections.

The infection atrium in this patient as is the case in so many is not clear. In an attempt to throw some light on this point I have made in this case as in three others, repeated blood agar plate cultures from swabs, of the tonsil and material of the tonsillar crypts. The flora in all was a great predominance of green producing organisms resembling streptococcus viridans and pneumococci but a noteworthy diminution and usually a total absence of hemolyzing streptococci. This fact together with clinical evidence speaks strongly in favor of the view that the tonsil is most frequently the infection atrium. It is for this reason that tonsillectomy should be properly carried out in all cases which we see who have a valvular lesion if there is the slightest evidence of tonsillar infection.

Summary.—The following points merit emphasis: The form of endocarditis known clinically as subacute or chronic infectious endocarditis of which the reported case is a typical example is due in the vast majority of cases to organisms of practically no virulence in the ordinary sense. Death is due to exhaustion, the result really of a prolonged parenteral protein intoxication. The explanation of how these organisms which are so freely susceptible to phagocytosis are able to produce the endocarditis in the first place and ultimately cause death lies in their adaptation to the antibodies of the host and in part to the fact of their peculiar tendency to grow in clumps, etc. All workers now agree that this form of endocarditis is not due to either typical pneumococci nor streptococci. The name of the disease therefore should include the name of the micro-organism which is responsible in so many cases.

From a prolonged study of many strains in my hands experimental proof has been obtained which goes to show that not only the strains from endocarditis but similar organisms from the throat and elsewhere which correspond exactly to Schottmüller's "streptococcus viridans" are really modified pneumococci and hence the name subacute or chronic pneumococcus endocarditis is most appropriate. The term "endocarditis coccus" as suggested recently by Libman,*

* *Loc. cit.*

while valuable in calling attention to the fact that this form of endocarditis has a quite distinctive bacteriology should not be adopted because after all endocarditis is due to other bacteria more frequently than to this micro-organism and because it is found in other diseased conditions.

The results of a daily study of the number of bacteria in the circulating blood, the phagocytic and destroying power of the patient's blood in relation to the temperature and the subjective symptoms at the bedside show here as I have found in three other cases that intoxication is especially marked during the time when the bacteria are being actively destroyed. The patient may be feeling very well even though the bacteria have increased markedly in number.

The administration of small doses of vaccine prepared from the homologous strain must be looked upon as beneficial because it activated the blood and reduced the number of bacteria; while larger doses seemed to do harm. The injection of immune rabbit serum caused no demonstrable good effect. The means of defense on part of the host is certainly largely one of phagocytosis in the broad sense but the mere taking up of these bacteria by the patient's leucocytes is no proof that there will be a corresponding destruction.

BISMUTH PASTE, ITS USES IN SURGERY.*

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GENTLEMEN:

ANY of you are no doubt familiar with the treatment of suppurative sinuses by means of bismuth paste. I will therefore omit all theoretical discussion and confine my remarks to practical points of its application. It has a threefold use in surgery:

First.—*For diagnostic purposes.* By this I mean the tracing of sinuses by means of radiographs, taken after the sinuses have been injected with the paste. These radiographs show with convincing clearness the extent and the direction of the fistulous tracts and often lead to the focus from which they originated. This is a very useful procedure; it permits us to recognize the cases in which an operation is not feasible. In other words, it prevents the surgeon from performing useless operations. The probe and colored fluids which formerly were the principal aid in diagnosis of the extent of these sinuses must, in the light of this newer method, appear very unreliable. A picture of a network of sinuses such as I show in Fig. I illustrates how irrational it would be to try to estimate the direction or depth of such a sinus by means of a probe. At the first bend of the sinus the probe would be arrested and would leave the surgeon under the impression that he had reached the



FIG. I.—Network of sinuses from hip-joint disease.



FIG. II.—Two sinuses, both originating from hip-joint, but not communicating. Sinus "A" extends into the pelvic cavity. Sinus "B" is external, gravitating along the fascia lata.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

bottom of same, while, in fact, there exists a network of sinuses beyond imagination.

Another quite instructive illustration of the diagnostic value is shown in Fig. II. This is a radiograph of a hip joint of a young girl of 17, who for two years had two sinuses, one opening above Poupert's ligament and the other about three inches external to the first. Both secreted pus freely and patient was extremely emaciated, weighing 92 pounds. These sinuses no doubt originated from a tuberculosis of the hip joint. A glance at this radiograph teaches us that these two sinuses have two different sources. The one above Poupert's ligament originates in the pelvis underneath the psoas muscle; the other gravitates down along the fascia lata, but they do not communicate. Without the aid of this radiograph a surgeon would be much tempted to pass a probe from one opening into the other in order to expose the bottom of the sinus, which, of course, would be a surgical error. Injections in this case led to complete recovery, patient gaining 48 pounds.

Second.—*For therapeutic purposes.* At the present time very few doubt the therapeutic effect of the paste in old chronic sinuses and empyema. In our own series of cases treated at the North Chicago Hospital, we have used the paste in practically every variety of chronic suppurations, such as sinuses resulting from spondylitis, hip joint disease, tuberculous knee, ankle, shoulder, wrist and ribs. In addition, we have used it in osteomyelitis in all parts of the osseous system, including the clavicle and fibula, which are extremely rare; further, in chronic suppurations of soft structures, such as sinuses after extirpation of kidney, broken down tuberculous glands, rectal fistulæ, fecal fistulæ, and sinuses following laparotomy. The accessory sinuses of the head, the fistulæ of the alveolar process, have also been treated by this method. Only fistulæ of the gall bladder, the pancreas, and those communicating with the cranial cavity, have for obvious reasons not been treated, with the exception of one case of biliary fistula referred to me by Dr. Robt. Morris of New York, in which I tried it and obtained a splendid result. (Case reported by Dr. Morris.)

Medical men are, as a rule, very reluctant in trying a new method of treatment, unless it be advocated by a great authority or unless its merit is self-evident. This conservatism is commendable, since it preserves the old and well tested methods until some real advance is produced. In the introduction of the bismuth paste into surgery the usual conservatism was somewhat relaxed, the method being tried extensively soon after my first publication in the *Journal of the American Medical Association* in April, 1908. The readiness of the surgeons to try it I ascribe to the fact that I proposed a comparatively simple treatment for an affliction so hopeless and discouraging that anything reasonable in the way of a new treatment was acceptable, and to the

fact that my first presentation of treated cases proved conclusively its merits. Further, suitable cases were so abundant everywhere and patients so willing, that there was ample opportunity for testing the method.

Reports began to pour in rapidly from many parts of the world. Some authors reported astonishingly good results, others could obtain only mediocre results, and still others had nothing but failures. These extreme differences in results were not easy to explain at that time, but I believe that at the present time we can account for same in a large measure, and this shall be the main topic of my paper. For the benefit of those who failed I shall try to explain the usual causes of failure, and give them the benefit of the lessons gained from my experience in this work.

In the January 19, 1910, No. 33, of the *Muencher Med. Wochenschrift*, I published many striking examples, showing why some had failed to cure certain cases, while the same cases were cured in the hands of those more familiar with the subject.

Two factors are principally responsible for failure,—employment of *faulty technique*, and treating *acute* instead of chronic suppurations.

This fact was impressed upon me during my recent visit to European clinics, where I was frequently asked to demonstrate the bismuth injections on patients. In not one single instance was I furnished proper instruments and rarely was the injecting material properly prepared. Instruments were usually improvised and thus the treatment could not be properly applied. Visiting surgeons at my clinics often express their surprise when witnessing the application of this method on my own patients, usually admitting that they had not carried out the treatment correctly, which explained to them some of their failures.

It is quite difficult to obtain statistics as to the extent of the use of this method and the various surgical conditions in which it has been applied, and the results obtained. Since the injections of the paste are often carried out in the doctor's office or at the home of the patient, the bulk of the cases come first into the care of the general practitioner in the country, and thus only a small fraction of treated cases find their way into literature. Large hospitals in this country and clinics abroad, as well as individual surgeons, have from time to time made reports of their experience, the collective report of which up to 1911 is as follows:

Name.	No. of Cases.	Disease.	Percentage of Cures.
Oehsner (Chicago)	20	Tubercular sinuses.	.55
Ridlon & Blanchard (Chicago)	17	Tubercular sinuses.	.53
Beck, E. G. (Chicago).	17	Collective report. . .	.64
Robitschek (Minn.)	9	Tubercular sinuses.	.55
Don (Edinburgh) . . . . .	..	Tubercular sinuses.	.17
Rosenbach (Berlin)	4	Tubercular sinuses.	.50
Dollinger (Budapest)	16	Tubercular sinuses.	.12½
Beck, Jos. C. (Chicago)	310	Accessory sinuses. . .	.22
Pennington (Chicago).	17	Rectal fistulæ . . . . .	.76

Baer (Baltimore)	12	Tubercular sinuses. .33½
Stern (Cleveland)	4	Tubercular sinuses. .100
Steinmann (Munchen)	5	Tubercular sinuses. .20
Bogardus (U. S. A.)	1	Tubercular sinuses. .100
Vidakovich (Russia)	2	Empyema100
Nemanoff (St. Petersburg)	6	Empyema100
Ochsner, A. J.	14	Empyema85
Beck, E. G. (Chicago)	11	Empyema82
Ely (New York)	14	Tubercular sinuses. .43
Hines (Cincinnati)	9	Tubercular sinuses. .89
Cuthbertson (Chicago)	1	Intestinal fistulæ. .100
Sandor, Sag (Budapest)	2	Otologic100
Heitz, Boyer & Morens (Paris)	11	Renal sinuses73
Zollinger (Zurich)	24	Tubercular sinuses. .54
Schober (Philadelphia)	5	Tubercular sinuses. .80

It must be taken into account that this represents a class of cases in which other treatments had previously been applied and had failed; some cases had even passed through a series of as many as 20 unsuccessful surgical operations, often the disease having lasted many years, yes, even 40 years, as occurred in two of my cases. The accumulation of an army of invalids lingering with suppurative sinuses was sufficient evidence of the fact that we had no remedy for this class of cases.

Third.—*For prophylactic purposes.* By this is meant the prevention of sinuses. We know that the sinuses are the sequelæ of pre-existing abscesses. We must begin by treating the abscess in order to prevent the sinus. This procedure consists in the opening of cold abscesses and injecting them at once with a 10 per cent. bismuth paste, without suturing the opening or introducing a drain. The quantity used depends upon the size of the abscess, but should not exceed 100 grams, because in these fresh abscess

walls absorption of bismuth is apt to take place more rapidly, and cause bismuth poisoning. The injection acts as a modifying substance, similar to that of iodoform emulsion, and prevents secondary infection. In a series of over 100 cases in which I have employed it, only one developed secondary infection, and only four resulted in sinuses (no deaths). Follin's figures show that 50 years ago, 56 to 60 per cent. of all psoas abscesses operated upon died from secondary infection. This method is described in detail in the *Revue de Chirurgie*. T. XLII—Dec. 10, 1910.

The lessons which I have learned in treating a series of nearly 800 cases of suppurative sinuses, empyema, and abscesses during the past five years, comprise so many points that I cannot discuss them here in detail, but I shall show radiographs of cases selected from my own series, which illustrate most convincingly the causes which led to failures and reasons for success. (Here Dr. Beck illustrates stereoscopic radiographs, and by lantern slides a large number of cases, such as spondylitis, hip joint disease, rectal fistulæ, empyema, etc.) These examples of causes of failures and their correction will no doubt help you in carrying out this method to the best advantage, and I desire only to put down some of the important rules:

(A) Before operating upon any fistula or sinus procure a radiograph of the sinuses injected with the paste. You will thus exclude inoperable cases and save the patient a useless operation.

(B) Do not use the paste in very acute cases; we have other efficient treatment for same.

(C) For diagnostic purposes, use stereoscopic radiographs instead of single plates.

(D) In cases where a sequestrum, a foreign body, or a stump of diseased tissue is at the bottom, the paste treatment will be useless until these are removed.

(E) The most common error is "to inject too frequently." The sinus should be injected and at least one week should elapse before a second injection is made. If the purulent discharge changes into a serous (sterile) one, the injection should *not* be repeated. If the purulent discharge persists, the sinus may be reinjected.

(F) It is essential that every part of the fistulous tract be filled with the paste at one time, or else the injection will be useless, because the focus which was not reached will secrete pus and re-infect the entire tract.

(G) If more than one opening exists, the paste should be injected through one opening only and allowed to escape from all the rest. As soon as it appears to escape, the openings should be closed by pressure of finger so as to gently force the paste into other side branches of the sinus.

(H) In all cases the proper instruments, such as illustrated in my monograph, should be employed in order to carry out the technique properly.



(1) The possibility of bismuth poisoning should always be borne in mind. Follow the rules and it will not occur. If it occurs then it can be checked by again following the rules.

RULES FOR PREVENTION OF BISMUTH POISONING.

(1) Do not use too large a quantity in cases where large cavities such as empyema exist.

(2) Watch for symptoms of blue ulceration of gums and mouth, for diarrhoea, and emaciation.

(3) Blue border of gums alone does not indicate bismuth poisoning, but means that we are at the border line and should cease injecting until it disappears.

RULES FOR TREATMENT OF BISMUTH POISONING.

Flood the sinuses or cavities with warm olive oil, retain it 24 hours and then withdraw same by suction. Wash sinus with olive oil daily, until symptoms disappear. Do not scrape the walls of the cavities for the removal of the bismuth, as this aggravates the condition materially.

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A REPORT OF A CASE OF BISMUTH POISONING. EMPLOYMENT OF THE "BRYANT BULL-DOG." RECOVERY.

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JUDGING from the experience of Emil G. Beck and from the number of cases reported by others, poisoning from the employment of bismuth paste occurs infrequently. A few deaths have been reported from its use and not a few of the cases which recovered were in a critical condition, which facts demonstrate the point that the injection of bismuth paste is not without danger, that the effect of each administration should be watched closely that the symptoms of poisoning may be recognized early in order that prompt measures of combating it may be instituted.

The following case, which occurred in the service of Dr. J. D. Bryant of Bellevue Hospital, seems to emphasize two features, namely, that some patients are extremely susceptible to bismuth injections, and that even after prompt meas-



FIG. 1.

ures are taken to overcome its influences, symptoms subside slowly.

The patient, C. B., was admitted October 18, 1911, suffering from an empyema involving the left pleural cavity. After several weeks of treatment the original cavity was reduced in size, according to measurements, to four ounces, and he was injected with three and a half ounces of a 33 1-3 per cent. bismuth-subnitrate-vaseline paste. Forty-eight hours later, when I next saw him, he was cyanotic, complained of diarrhoea and abdominal pains. There was a bluish-purple line running along the border of the tongue from base to tip. This blue line was also well marked on the upper jaw along the gums, which were bleeding, soft and projecting between the teeth, as shown in Fig. I. Salivation was also well marked.

He was given a purge at once, the cavity was injected with olive oil and on the following day attempts were made to draw off the fluid with a syringe as advised by Beck, without success, and a Bryant "Bull Dog" then applied, as shown in Fig. II, and described below.



FIG. II.

The patient's condition at this time seemed critical, he was extremely weak, with a temperature of 103 degrees, the phenomena in the mouth were more pronounced, and his diarrhoea unchanged.

In spite of repeated injections of olive oil and the application of the suction apparatus, his condition appeared unchanged for several weeks, after which time the symptoms gradually subsided, the patient slowly improved, and eventually recovered.

The Bryant "Bull Dog" which was employed seemed invaluable in this case and appears to be an excellent substitute for the simple syringe; in fact, it possesses many advantages over the latter. It can be manipulated and managed by the patient himself, its action is continuous and can be regulated by the stop-cock, its application is simple, the olive oil can be injected through the tube without removing the whole apparatus and the glass tube makes it possible at all times to note the character of the fluid withdrawn.

For those who perhaps may be unfamiliar with it, or may wish to make use of it under similar conditions, a short description of its application is given.

A large rubber catheter is inserted through the opening in the chest cavity. Around the catheter at its exit, small strips of rubber tissue are placed and sealed to the chest and catheter by chloroform. Over this is then placed thin pieces of absorbent cotton sealed to the chest and tube with collodion, and over this, gauze pads applied and held to the chest with adhesive plaster strips, as shown in Fig. II.

Into the end of the catheter a small glass tube is inserted; then, in order, outward tubing, stop-cock, tubing, and, lastly, Politzer bag (Fig. II). When the bag becomes full the cock is shut off, the bag removed and emptied, washed out, collapsed, and reapplied, and the cock turned on again. The bag is placed in the patient's pocket and attended to without any inconvenience whatever.

CLINICAL VAGARIES IN SOME FORMS OF LIVER DISEASE.*

By N. E. BRILL, M.D.,
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THOSE who attempt to interpret clinical phenomena in relation to structural changes associated with disease of the liver will encounter great difficulty.

This is due to the fact that there is much diversity of opinion among pathologists as to the nature of some of the pathological changes associated with certain diseases of the liver, and also to the factor of still greater importance that the immediate and remoter influences of the products

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of disturbed metabolic states and functions on the liver cells have not yet been satisfactorily determined. These remarks are especially applicable to the group diseases of the liver summarized under the title of hepatic cirrhoses. With the exception, perhaps, of the atrophic cirrhosis of Laennec, each form of liver cirrhosis differs in its pathological anatomy as much as do the clinical signs whose presence is supposed to establish the diagnosis of the specific or individual pathologic state of the liver.

When we reflect that the etiological factors supposed to be productive of each form of liver cirrhosis may be entirely wanting, and when we remember that the ordinary form supposed to be due to a specific causative factor like alcohol may produce instead of an atrophic cirrhosis a hypertrophic cirrhosis, and that cases of Laennec cirrhosis develop in which alcohol as a causative factor can be totally excluded, we get some idea of the uncertainty and difficulty of the problem.

Again, much confusion has arisen in the minds of clinicians who attempt to classify clinically the various manifestations of liver disease associated with what clinically may be any other disease of the liver than one of the cirrhoses, and yet which may subsequently prove on pathological examination in reality to be a form of cirrhosis. This has given rise to the burdensome and cumbersome classification indulged in by most authors dealing with diseases of the liver and definitely those of the French school, especially Gilbert, Fournier, Chauffard and others.

The clinical association of enlargement of the spleen, the associated absence of splenic enlargement, the facts that the spleen enlarged before the liver showed clinically signs of being affected, or that the liver enlarged first and the spleen subsequently, furnished a basis for a useless classification suggested especially by French writers. Likewise the associated or absent ascites has further complicated matters. Rolleston in his admirable treatise on Diseases of the Liver attempted to restore order out of chaos with a fair amount of success. Yet forms of cirrhosis appear which clinically do not correspond with any of Rolleston's types.

The object of bringing the following cases to your attention is to demonstrate the variations in the clinical aspect of some definite types of the cirrhoses and to support the truth of the introductory remarks. Each case is certainly unique in its deviation from the clinical type of disease, and merits consideration.

The first case to which I would ask you to give your attention is that of a male, A. F., a clerk by occupation, aged 18 years, who came under my observation in November, 1911.

His family history shows a father and a mother living and well, five brothers and sisters in good health, no deaths having occurred in any members of the immediate family. There is no history of tuberculosis, neoplasms, gastric,

hepatic or splenic disease occurring in any other member of this family.

Past history.—Patient had measles, pneumonia at three years of age, no scarlet, no tonsillitis, no rheumatism. His habits were exemplary; he worked in a store, but obtained his food irregularly. Venereal history is denied as to gonorrhoea and syphilis. Two examinations of his blood during my period of observation both attended with negative Wassermann reactions would tend to corroborate the absence of specific venereal infection.

Present History dates back about three and a half years, when his complaints started with sharp, shooting epigastric pain. These attacks at first were irregular as to time and infrequent, occurring about twice weekly. After about four months the pain attacks came on definitely one hour after eating, the pain extending to the abdomen generally, when they would assume the character of an abdominal colic. This was associated with vomiting of a greenish fluid, which brought relief, after which his pains would subside. There was no jaundice with any of these attacks. During this time he became markedly constipated. For days at a time he would be free from all appearance of pain. Then the pain would reappear, having distinct relationship to the ingestion of food, as the boy himself noticed.

These attacks becoming more and more numerous and the pains becoming more intense, he sought hospital relief and entered in July, 1911, the Lebanon hospital in New York, where the diagnosis of gastric ulcer was made and operation for its relief was suggested to the boy's family and accepted. The operation, we learned by communication with the hospital, revealed no evidences of gastric ulcer, but what was considered to be a chronic appendicitis and the appendix was removed. The gall bladder and common duct contained no calculi. For two weeks after the operation the patient was relieved of his pains and returned to his home.

Immediately after his return the pains reappeared, though from that time on they were not associated with vomiting and became more localized to the epigastrium and right hypochondrium. He returned to the hospital where he had been operated on in the hope of relief, and remained there for six weeks. During these six weeks he had *chills followed by fever*, and toward the end of September he became jaundiced. He left the hospital immediately after this distinctly jaundiced, whereupon he entered my ward at Mount Sinai Hospital on November 29, 1911.

The patient stated while his jaundice had persisted, its intensity showed intermittent variations, at times his color being greenish yellow, at other times only a light pale yellow. He noticed that his urine was very dark and that his stools were often gray in color.

The pains now start in the epigastrium, radiate around the lower thorax to the right kid-

ney region and at times to the shoulder. The patient insists that he has daily chilly sensations with fever. He does not vomit. He has occasional nocturnal frequency of urination. At times eating will relieve an attack of pain. He is constipated, has no cough and does not have headaches. He claims to have lost 27 pounds in the past six months. He never noticed blood either in his preceding vomiting or in his stools. He suffers greatly with itching of the skin.

Synopsis of symptoms.—1. Onset three and a half years ago; epigastric pain, nausea and vomiting. 2. Increased severity six months ago. Operated at Lebanon Hospital for supposed gastric ulcer. 3. Jaundice began three months ago, associated with chills, fever, clay colored stools, dark urine. 4. Great loss of weight and strength.

Physical examination.—Boy tall, emaciated and very pale; scalp, ears and mastoids, negative; eyes, conjunctivæ yellow; mouth, soft palate shows spots of ecchymoses; skin, jaundiced, olive green in color, laparotomy scar in upper right abdomen; thyroid, negative; lymph nodes, no enlargements; thorax, lungs negative, heart negative, no tenderness over sternum; liver, slightly enlarged, upper border 5th rib, lower border 1 cm. below costal margin in anterior axillary line, its surface is apparently smooth, it is not tender to pressure; spleen, cannot be felt, nor is it enlarged to percussion. No ascites.

Blood.—Hemoglobin, 22%; red blood cells, 1,500,000; color index, .7. The red cells show anisocytosis, poikilocytosis, but no nucleated forms. White blood cells, 13,000; polynuclears, 85%; small lymphocytes, 15%.

A gastric test meal given gave the following data after an hour: Amount recovered, 30 cc.; acid reaction, total acidity, 70%; free HCl, 35%; absent bile.

Feces.—Clay colored, absent bile, no ova or parasites; positive reaction for blood by benzidine and guaiac tests.

On December 5, 1911, measurements of hepatic dullness show an increased area extending 2½ cm. below the costal margin, the edge of the liver being fairly sharp and smooth as before.

The hemoglobin is now reduced to 11% and the patient was given a transfusion of blood, using a suitable donor. After the transfusion the hemoglobin gave a reading of 40%, but next day fell to 35%, about which it remained some time.

December 15, 1911.—General condition poorer. Movable dullness observed for first time in patient's abdomen, demonstrating some ascites. There is some edema of abdominal walls. Spleen not palpable. Liver 3 cm. below free border. Blood: hemoglobin, 40%; red blood cells, 3,380,000. A blood culture was taken today and proved to be negative.

Urinary examinations from the onset made daily showed some factors important in relation to diagnosis.

The urine at variable times showed a faint trace of albumin and hyalo-granular casts. While the associated night urination and the anatomical urinary elements indicated a low grade of a chronic interstitial nephritis, this was but an additional complication of his disease.

Of more importance is the persistent presence of bile, the occasional marked acetone reaction and on one occasion the presence of sugar in the urine. The sugar could not be accounted for by any factor like increased carbohydrate administration. We will revert to this later in considering the diagnosis. A hint as to its interpretation at the time is afforded by our ordering an examination for pancreatic ferments, obtained by passage of the duodenal tube, and examination of the stools for evidences of such ferments. The result of these examinations made the tentative diagnosis more secure, for the stools examined by Dr. Crohn contained no evidences of ferments, and the duodenal secretion also examined by him revealed absence of amylase, trypsin and steapsin, evidences apparently of loss of pancreatic secretion.

Analysis of the gastric contents showed no evidences of gastric disease. Test meal given on November 30, 1911, revealed the following:

Recovered, 30 cc.; reaction, acid; total acidity, 70; free HCl, 35; bile, absent; blood, absent; lactic acid, absent; microscopical, negative.

Subsequent analyses gave similar results.

Blood examination, November 30, 1911:

Hgb., 22%; R. B. C., 1,500,000 (anisocytosis, poikilocytosis, no nucleated forms); W. B. C., 13,000 (polys., 85%; S. L., 15%).

December 9, 1911: Hgb., 11%; R. B. C., 1,250,000.

On this day transfusion was done, after which the hemoglobin increased, as did the number of red blood cells to 35% and 3,380,000 respectively.

Fever was present at all times during observation, associated at times with distinct chills. The temperature was of decidedly septic type with marked daily excursions as a reference to the temperature chart will show.

Diagnosis.—The consideration of the nature of the disease which afflicted this young man was attended by some difficulty. All possible theories of definite disease were met by definite objections.

The operation at Lebanon Hospital revealed patent bile ducts and absent ulcer of stomach. Hence a conclusion based on the presence of a cholelithiasis or of a stricture of the duct due to ulcerative process in the duct would have to be excluded. Still the patient presented all the symptoms of an obstructive jaundice with a possible infectious cholangitis. In the absence of biliary calculi and the presumptive absence of gastric ulcer or duodenal ulcer or tumor a pyelphlebitis would have to be excluded.

The absence of etiological factors of ulcerative processes such as dysentery, etc., in the intestinal

tract would tend to exclude the presence of a liver abscess, though the increasing size of the liver with chills and fever gave some evidence of support to such a condition, and the operation at Lebanon Hospital may have afforded the etiological factor.

After much discussion my original tentative diagnosis considered seriously only those conditions which might give rise to the clinical picture presented by this patient:

1. A post operative lesion caused by peritoneal exudate and adhesion either compressing the duodenum and the bile ducts or kinking these structures to such an extent that neither bile nor pancreatic secretion could enter the intestine; or a post operative infectious pylephlebitis.

2. The presence of a new growth in the duodenum involving the orifices of the contained bile and pancreatic ducts.

3. The presence of an atypical form of Hanot's disease.

Fever as an accompaniment of liver diseases, as is well known, need not indicate any infectious process. In fact, it is rather a common clinical feature in all diseases of the liver. Independent of infections, fever of a septic type occurs as an accompaniment of stone in the common duct, to which Charcot called attention and is known as the *intermittent* hepatic fever of Charcot. It is present in the ordinary form of Laennec cirrhosis at times. It is common and a marked feature of Hanot's disease; it is present in obstructive biliary cirrhosis as well as in the hypertrophic hyperplastic cirrhosis; it is also a feature in the toxemic hepatic states such as acute yellow atrophy and in phosphorus poisoning. One must not consider the type of fever as of much diagnostic import in liver disease.

The chief and important diagnostic factors in this case were those showing ablation of biliary secretion in the intestine and perverted function of the pancreas. Any one of the three conditions just mentioned would satisfy the postulates. We leaned mostly to a tumor, either carcinoma or sarcoma, of the duodenum as most probable, and as carcinoma is more frequent in the duodenum than sarcoma our original diagnosis was a presumable carcinoma of the duodenum involving the middle of the second portion of that part of the intestine. With that in view we consulted with one of the chiefs of the surgical service at Mt. Sinai Hospital as to the advisability of another exploratory operation, which being agreed upon, the patient was transferred to the first surgical division for such procedure, December 18, 1911.

The patient was operated upon shortly after his transfer. In opening the abdominal cavity a considerable quantity of brownish fluid escaped through the wound. The liver was readily exposed and showed considerable enlargement. A dark olive green color, its surface was finely wrinkled and demonstrated three millet

seed large grayish-yellow semi-translucent masses. The consistency of the liver was hard like a cirrhosis. Aspiration of its parenchyma in various directions showed no abscess but from the punctures a peculiar gelatinous whitish material exuded for a moment.

Palpation by the surgeon revealed patent bile ducts, no distended gall bladder, and the absence of stones in the gall bladder, the hepatic, cystic and common ducts. To palpation the pancreas and duodenum seemed to be normal. There were no post operative adhesions or kinks in the neighborhood of these structures. There were no enlarged lymph nodes in the portal fissure. The wound was then closed and after a few days the patient was returned to my ward. Considerable ascitic fluid leaked from the wound for a couple of weeks, whereupon union became complete.

After this we were in greater doubt than ever as to the nature of the illness. Considering all our possibilities of a definite diagnosis, the only one of our three tentative judgments left unassailed by apparently positive evidence was Hanot's disease. The objections to this diagnosis was the absence of a large spleen and the presence of ascites. However, the positive factors for diagnosis were the abdominal crises, the intermittent type of temperatures, the jaundice, the large liver, its color, the granular masses on its surface revealed by operation. We could not reconcile the pancreatic disturbance of function with this disease; hence, we concluded, as a final diagnosis, that we were dealing with a very atypical form of Hanot's disease, atypical on account of the persistent acholic stools, the presence of ascites and the absence of splenic enlargement, and the absence of pancreatic secretion.*

The second case deals with a man, J. Q., 49 years, who came under my observation on October 9, 1911. His family history shows nothing of importance or relationship to his disease. He had measles in childhood and nine years ago while in the south, being a traveling salesman, he had a plasmodium infection. His indulgence in tea and coffee was moderate, and he partook occasionally of the cup which cheers and sometimes inebriates, perhaps more frequently than was wise, he says "six or seven whiskies a day, beer only occasionally." He denies ever having had any form of venereal disease.

His complaint is of weakness existing for the past four years, a feeling of weight in the epigastric region following each meal. After

* Since this was written the patient died. The autopsy revealed the true condition. There was an extensive sarcoma of the duodenum involving the lower third of its first part and the entire length of its second part. Duodenal wall was entirely replaced throughout the affected portion by neoplasm. The common bile duct was the diameter of about $2\frac{1}{2}$ cm. and the pancreatic duct of about 1 cm. From this it may be seen how a clinical judgment may surpass in exactness a surgical exploratory examination.

While the clinical picture of the disease pointed to a tumor of the duodenum involving the orifices of the bile and pancreatic duct, two operative investigations failed to reveal such growth.

eating his meals he always became somnolent, the drowsiness lasting from one to four hours. His appetite is very good and his bowels perfectly regular. On one occasion he had an attack of pain in the right hypochondrium which radiated to the right shoulder, the pain not being intense. He has noted a darkening of his face and hands for some years, four at least. He had to get up two or three times nightly to void urine. He suffers occasionally with headaches, has no vertigo. His acute complaints date back just one year when he asserts he started with daily chills and fever, increasing weakness and loss of weight which in the past year, he says, amounted to 20 pounds.

When he was treated for the malarial infection nine years ago the physician told him at that time that he had a large liver. The physical examination revealed a man of middle height with scant adiposity who showed a brownish-yellow discoloration of the face and neck with irregular chocolate-brown pigmentation spots over the back of the neck and pigmented moles on the back. There were no objective signs of pulmonary or cardiac disease nor of any of the structures in the mouth, neck and thorax.

The examination of his abdomen revealed an enlarged, hard, smooth not tender liver, whose upper border was elicited by percussion to be in the third right costal interspace and whose lower border was distinctly felt level with the umbilicus. Tracing the lower edge which was easily done by palpation, it extended obliquely upwards across the left abdomen to the left anterior axillary line where it entered behind the left costal margin of the 7th rib. The left lobe of the liver formed quite a prominent bulging in the epigastric and left hypochondrium. The spleen could not be felt, nor did percussion show it to be enlarged. The rest of the abdomen was somewhat lax, no intra-abdominal masses were present and no areas of tenderness. There was and is at the present time no ascites.

The rest of his physical examination which was thorough and complete was *absolutely negative*.

Gastric contents.—Test meal: 60 cc. recovered; total acidity. 92; free HCl. 28; no blood; absent lactic acid.

No Boas-Oppler bacilli.

Blood examination.—R. B. C. 3,408,000, Hg. 62 per cent., C. I. .9. W. B. C. 1440, poly. 80 per cent., lymphocytes 13 per cent.

Feces.—Negative for blood, both with guaiacol and benzidine. Careful search revealed no ova or parasites.

Urine.—1016, acid. Very faint trace of albumin; no casts.

Daily subsequent analyses and examinations of blood, stomach contents, feces and urine showed no change from the above which would be significant. Both trypsin and steapsin were present in the feces. *Wassermann reaction of blood was negative*.

When the patient was referred to me the physician who had previously observed him made a tentative diagnosis of liver abscess, considering the epigastric bulging, the increased size of the liver and the septic type of temperature as sufficiently indicative. In the absence of tenderness the presence of a general uniform enlargement laterally, upwards and downwards, the lacking etiological factors such as dysentery, abdominal operations, hemorrhoids, etc., I could not agree with the diagnosis.

Considering the clinical picture I was inclined to regard the disease as an unusual form of hepatomegaly not corresponding with any of the usual forms of hypertrophic cirrhoses. In some respects it coincides with that form of enlargement of the liver described by Budd in 1856 and which Hanot rescued from obscurity by giving it the name of Budd's cirrhosis. I could not regard the condition as belonging to the ordinary form of hypertrophic cirrhosis, nor of a mixed hypertrophic cirrhosis with fatty infiltration of the liver cells, because there were no evidences of portal obstruction such as enlarged abdominal veins, ascites, hematemesis, etc., because there was a persistent pyrexia, because there was bronzing of the face.

Careful repeated search of the blood before, during and after the pyrexia revealed no plasmodia.

The liver is constantly increasing in size and is today behind the iliac crest in the axillary line, at least 3 cm. larger than when the patient first came under our observation. In response to the numerous requests on the part of the house staff and of some of my associates at the hospital, surgeons and physicians, who believed we were dealing with an hepatic abscess, I was induced to permit the surgeons to make exploratory aspirations of the liver. The liver was thereupon aspirated in all directions upwards, downwards, in front and behind, with negative results.

A full course of quinine treatment given hypodermically had at first no influence on the pyrexia. After a week of such treatment the temperature began to fall and the febrile phase disappeared, to return again shortly afterwards. However, the patient was free from fever for almost three weeks when it returned, assuming the same septic type as before. Notwithstanding a second course of quinine treatment the fever was now uninfluenced by any medication. Perhaps the malaria of nine years ago was the fever of hepatic disease.

Toward the middle of March the conjunctivæ became tinged, the blood gave reaction for bile as did the urine. The jaundice which has now developed is very variable, never intense. His stools are not acholic. He is gradually losing weight and strength.

The white blood count varied from time to time showing 14,000 and 23,000 as the extremes. On December 11th, the polynuclears were as high as 91 per cent, with 17,500 whites.

In my opinion there is no clinical category in which this case can be placed.

The unusual combination of features are the bronzing of the skin, the continuous leucocytosis and polynucleosis, the colossal smooth liver, being as large as any I have seen even in the Gaucher type of primary splenomegaly, the septic type of temperature, the recently developing jaundice, make this case very interesting and exceptional from a clinical aspect. The colossal liver associated with bronzing of the skin and the persistent pyrexia would exclude the ordinary forms of hepatic cirrhosis. The smooth liver and negative Wassermann reaction (twice) would negative syphilitic disease of the liver. The enlarged liver and pigmentation of the skin might suggest hemochromatosis, but the absence of pancreatic involvement at such a stage of liver enlargement would be unusual. There was no evidence at any time of sugar in the urine, which invariably exists in advanced cases of hemochromatosis.

ACUTE AND CHRONIC CONGESTIONS OF THE LIVER.*

By BENJAMIN W. STEARNS, M.D.,
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AS regards the minute anatomy of the liver, both normal and pathological, this will be passed over for the consideration of the pathologist and surgeon. Granting also due credit to laboratory workers, for the knowledge derived from their persistent and faithful labor, which has made a clearer field, for the practical use of the accumulated facts that the general practitioner may bring to the relief of his patients.

The liver, the largest of the abdominal viscera and likewise the largest gland of the body, occupies nearly the whole of the right hypochondriac, a large part of the epigastric, and extending a little into the left hypochondriac regions. This location of the organ will be important in determining the abdominal conditions that will be considered.

The lower edge of the normal liver dulness should correspond to the costal border of the true ribs, extending around to the crest of the ileum; the width of the superficial dulness should be about that of three fingers.

The blood supply of the liver is from the hepatic artery and portal vein. The artery brings nourishment and repair material to the tissues; the portal vein brings "grist to the mill." The hepatic veins conveying the blood away from the liver empty by two or three main branches into the inferior vena cava.

The lymphatic system, both superficial and deep is very extensive, serving as a sentinel

system for all extraneous poisons productive of those conditions with which the surgeon and pathologist are most familiar.

The nerve supply of the liver is mainly from the pneumogastric, which fact will be taken into consideration with a certain group of symptoms.

The excretory, or system of bile ducts is equally as extensive and important as the blood supply; the bile ducts serve as the sewerage system of the organ, taking care of the sewage products of metabolism constantly going on in the liver.

In following the blood supply we find sufficient indications of the chief function of the liver, viz., the modification of the products of digestion which come directly from the gastro-intestinal tract by way of the portal vein. It is here in passing through the liver cells that important changes of a chemical nature take place, before the products of digestion are allowed to mix with the systemic blood. Hence the liver is the great safeguard to the system by modifying the character of many substances taken through the digestive tract before they come in contact with more delicate tissues. This important office of the liver is too often lost sight of in analyzing the various disturbed conditions of the system that the general practitioner is called upon to treat and which will be referred to later on.

Benjamin Moore, of Liverpool, previously of Yale University, in an article on the physiology of the liver states that, "it is the chief metabolic laboratory of the body, in which the greater part of purification of the blood from either extraneous or excessive dissolved substances or its standardization, so to speak, is accomplished.

"It is by the liver cells that the degradation products of proteid metabolism in the tissues are prepared for excretion by the kidneys. Here also the final products of the breaking up of the hemoglobin molecule, after being robbed of their iron, which is retained and conserved by the liver cells, are either cast out of the circulation in the bile, or prepared for removal by the kidneys in the form of urinary pigments; here too the quantity of carbohydrate entering the systemic circulation is adapted and regulated to the needs of the organism by a system of chemical storage.

"In addition to these important operations many other chemical changes doubtless go on in the liver cells which we have not yet been able to follow out experimentally because of the inherent difficulties of such investigations, and hence it must be admitted that the physiology of the liver forms one of the most fragmentary chapters in our knowledge of biological change. Even in those instances

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

of hepatic activity which have just been enumerated, we know merely the end results because of the crudeness of our methods of study, and are ignorant in a great measure of the links in the chemical chain of transformation which occurs in the cell. It may be pointed out that such important chemical changes as occur in the liver require a high state of activity on the part of the liver cells, and hence it becomes necessary that an extra stream of pure blood in abundant quantity shall be supplied to the organ in addition to that carried from the intestines, in which not merely has the oxygen been largely used up in the intestinal capillaries, but also further vitiation has resulted from the addition of foreign constituents arising from intestinal absorption.

"Such a supply of pure blood is even more necessary in the case of the liver than in that of the lungs to which similarly in the body a large stream of venous blood is carried, for in the first place the hepatic cells are more physiologically active structures of a secretory type, while the endothelial cells of the pulmonary alveoli carry out a much more passive function, acting to a great extent as physical membranes; and in the second place the venous blood of the portal system is more heavily charged with substances foreign to the circulation and capable of acting as protoplasmic poisons.

"The liver is hence supplied with arterial blood by the hepatic artery and in addition the blood coming from the area of absorption is diluted, so to speak, as regards the products of absorption, by admixture with the splenic blood."

I refer to various authorities on the liver, not to construct a foundation on which to base remarks, but to call attention to the variance of my own observations and experience regarding the relation of the liver to the various disturbances of other organs and of some general conditions of the system, in place of the nebulous ideas occasionally expressed. It has been said that life is only worth living, when the liver is in a normal healthy condition. I will add that one-fifth of the conditions treated by the general practitioner, either arises or are affected from the condition of the liver, and only about one-third of them recognized in treating the patient.

When we stop to think that all the blood of the body passes through the normal liver as often as it does through the lungs, and that the greater part of the metabolic processes take place in the liver; we are reminded how necessary it is that the physician make a careful examination of the condition of the liver in every case of frequent headache, stomach trouble, hemorrhoids, constipation, kidney trouble, asthma, rheumatism,

bronchitis, and many stubborn cases of skin trouble; as well as jaundice, malaria, pneumonia, yellow and scarlet fevers, and any infectious disease.

PHYSICAL EXAMINATION OF LIVER.

Inspection may show a marked fulness of the right hypochondrium, and sometimes in thin subjects the lower border shadow may be observed to rise and fall on deep inspiration.

Palpation.—The lower border, even of the normal liver may often be palpated by the fingers laying gently against the abdominal wall just below the right costal border, on deep inspiration; any marked resistance in the edge of the liver indicates an abnormal condition of the liver tissue, as cirrhosis, chronic congestion or possible tumor.

The patient will be convinced of an abnormal disturbance of the liver by the examiner placing the closed fist on the ninth and tenth ribs in the mamillary line and pressing the ribs in gently but firmly to a depth of one inch and then projecting a short quick punch or concussion, which will elicit a deep seated soreness as if the liver had previously been bruised; the examiner by applying this procedure to both sides, in the case of liver congestion will find a marked increased resistance over the congested liver.

Percussion.—Should the area of dulness on percussion be found reduced especially of the left lobe, it is significant of atrophic cirrhosis; on the other hand, it will frequently be found enlarged, indicating congestion, with tendency to chronicity, unless corrected by appropriate treatment, which will be taken up in another chapter.

The author has seen many cases where the area of dulness extended the width of two or three fingers below the costal border, and cases where the left lobe extended over the pylorus and even below the umbilicus; a careful inquiry into the history of cases frequently show that the liver condition has existed for months, and even two and three years.

When we recall the fact that there are few, if any subjective symptoms to direct the attention of the patient to disturbances of the liver; it is for the careful diagnostician to ascertain the condition of the liver from the history of the case and a thorough physical examination, instead of making a careless guess of what the condition may be; a jaundiced hue of the skin and sclera is the only symptom referred to the liver by the laity, and these are only occasionally in evidence.

I shall confine this paper to acute and chronic congestions, or hyperæmia of the liver, since it is a subject that has been neglected.

Out of sixty papers in the current medical

literature during the past nine months, on various affections of the liver, only two treated of congestion of the liver.

Dr. Charles Lyman Greene of the University of Minnesota in his *Medical Diagnosis*, refers to transient active hyperæmia of the liver as unimportant, and chronic hyperæmia as invariably caused by disturbances of the venous circulation, generally from heart difficulty. He says the essential symptoms is increase in size as recognized by palpation, or percussion, with especial reference to the lower border, or lacking this increased density associated with a certain amount of pressure tenderness particularly over the left lobe, the secondary symptoms (such as chronic gastric catarrh and intestinal disturbance), and the existence of a primary cause." I can agree with the symptoms here stated, but not with the causes stated of the liver congestion.

Osler mentions in his practice, a hypertrophic form of cirrhosis, which in the early stage is enlarged and difficult to tell from a fatty liver; but makes no mention of congestion or hyperæmia.

All authorities agree that enlargements of the liver are frequently caused by continued use of alcoholic beverages. It is a safe position to assume, but I believe it a difficult point to prove or disprove.

From this point my personal experience and observations, for the past twelve years has left me somewhat isolated.

For in analyzing a group of symptoms connected with the liver, my logic has found the cart ahead of the horse, in a majority of cases that had been previously under treatment by neighboring physicians, and some cases that had been under treatment, even by specialists on the stomach.

The reasoning previously applied to many of the cases would lead one to look for turbid water to proceed up stream from the point origin.

I believe the principle cause of this error, in these cases is the frequent statement in text books and medical literature, that the appearance of the tongue, coated or otherwise, reflects the condition of the stomach, and stops at that; my observations bear out the statement but go a step farther, which I hope to make clear by a graphic grouping of interdependent symptoms. A patient consults the physician with the following problem to solve: frequent headaches, constipation, coated tongue, interrupted sleep, languor, poor appetite, possibly a history of intercurrent diarrhœa for a day, once in three or four weeks, chilly spells, occurring at the time of the diarrhœa; the patient barely able to attend to usual duties. The physician administers a cathartic, followed by a digestive

tablet and maybe a headache powder, for a few days the patient feels a relief and goes along highly pleased, in a few weeks the same thing occurs again. After several times, the patient consults another physician, with about the same experience, with possibly a diagnosis of catarrh of the stomach or a bilious attack, getting little encouragement of a permanent cure. In some cases the headaches becoming more frequent and more intense.

I will arrange a sequence of symptoms and add the overlooked link:

Subjective.—Headache, coated tongue, poor appetite, constipated, languor.

History.—Intercurrent diarrhœa, poor sleep, attacks of indigestion.

Physical Examination.—Tenderness over lobe of liver, increased area of dulness, tenderness on quick compression.

Examination of Urine.—Color, straw; sp. gr. 1004-6; no albumen, no sugar, diminished elimination of urea.

Diagnosis.—Congestion of liver caused by gluttonous indulgence, or incompatible menu.

As we recall the fact that the greater part of the metabolic processes take place within the liver, and are of a chemical nature; an over indulgence in some article of food, that is rich in those elements, of which the system may be already overstocked, will unbalance the process of metabolism, causing a disturbance of circulation through the liver, checking the secretory function, thus retaining much of the waste material that should pass off in the bile, the result of which disturbance will be shown by the diminished amount of bile in the stools. The portal system becomes congested, unabsorbed food remains in the alimentary tract, unless carried off by the action of cathartics, the lining of the stomach becomes foul, as shown by the eructation of offensive gas, the tongue becomes coated, loss of appetite, constipation, headache, and a variety of distressing symptoms, many of which have received names as though they were distinct disease entities instead of branches of the pathological tree arising from a congested liver.

To again return to the liver, Moore tells us that it is the liver cells that complete the degradation process of proteid metabolism, so those products are in suitable form for excretion by the kidneys. This must be so, for we frequently find with a congested liver a low sp. gr. of the urine, and diminished elimination of urea.

My observations for 15 years have lead me to firmly believe that in many cases, the exciting cause of parenchymatous nephritis is

a disturbed metabolism in the liver. This relation is mentioned by Steinthal in cases of gall stones obstructing the common duct.

And since all our efforts to bring about a cure of a well established nephritis have so far been futile, it is the strongest reason for taking up the question of congestion of the liver.

I want to call your attention to a fact as borne out by my own personal experience, that several so-called diseases by name are in reality branches of this pathological tree. When we have a patient suffering from "rheumatism, the urine highly acid, but low sp. gr. and when the test tube used for nitric acid contact test for albumen is allowed to stand for twelve hours, and shows up a mass of needle crystals of nitrates floating in it, the physician should make a careful physical examination of the liver, which four times out of five will be found enlarged and tender, which is the natural logical sequence we would expect. The rheumatism is caused by the products of uncompleted processes of metabolism, that have been interrupted by disturbances in the liver. A similar chain of symptoms will be found in many cases of chronic bronchitis, asthma and stubborn cases of eczema.

As previously mentioned, the liver will frequently be found enlarged in cases of malaria, pneumonia, and other acute and infectious diseases.

As regards prognosis from my own experience, it is generally favorable under appropriate treatment. To pronounce the prognosis from the expressed views of various authorities would be difficult indeed. Some do not mention it at all, others speak of the acute form as unimportant, and a number prefix the word chronic, which implies that it is a condition difficult to correct. The acute form very frequently becomes chronic by reason of being overlooked, and not receiving attention and treatment. I frequently see cases that have existed without doubt for two or three years, and I find that the longer the condition has existed, the more stubborn it is to correct.

The Treatment I have been following for the past ten years has been somewhat original, but it has proved gratifying, both to myself and the patients. In the ordinary case that has existed from one to six months with constipation, impaired digestion, frequent headaches, and light urine both in color and sp. gr., I give one gr. of mild chloride in divided doses, $\frac{1}{4}$ gr. every half hour, every fourth day (this of course is nothing unusual); in conjunction with the calomel, I depend mainly on the following: Tr. Iodin. Spts. Camphor, aa dr. V., Olii. Olivæ. dr. VI. M et. Sig. Apply over liver, rub in well, as

directed, night and morning. Shake label. The proportion of the ingredients of this prescription have often to be modified as required by the delicacy of the skin with various patients, but it is equally applicable and efficacious in all ages.

In comparatively recent cases of one or two months standing where the application has been thorough, after four or five days I have frequently seen the bowels become active for a day or two as though an active cathartic had been administered and the bowels continue regular from that time on; after a week or two the tongue clear off, the appetite return, the elimination through the kidneys improve, the headache vanish, and the system return to normal condition.

A tablet of the digestive ferments together with a bowel antiseptic administered after meals for a few days, aids materially in correcting the disturbed conditions. The agent I have found the most satisfactory for an antiseptic in these cases, is the calcium sulphocarbonate, in doses of 2 to 4 grs., combined with Po. Rhei. and Bismuth Salicyl. in capsule or compressed tablet. Where there is a diminished amount of urine secreted, I frequently give the Basham's Mixture, in 1 or 2 dr. doses $\frac{1}{2}$ hr. after meals. Since employing the external application for reducing enlargements of the liver, I have had no occasion to administer any of the so-called liver remedies internally.

As to the length of time the application should be continued, that depends on how soon the enlargement is reduced, it may be 3 or 4 weeks, or as many months. I have had a number of cases where the enlargement reduced half way down, and then became obstinate about further improvement. In some of these cases I have added thiosinamin, $\frac{1}{2}$ dr. to the ounce of the application, which would cause a further improvement, generally becoming normal, by persistent treatment.

The application leaves an amber colored stain on the skin, which in a few hours entirely disappears, when applied over an enlarged liver; the stain will continue to disappear from night to morning as applied until the liver has reduced down to its normal condition, when it will remain on the skin for three or four days, thus indicating no further need of the application.

I hope that in presenting this subject I have made one point prominent enough to be recognized, that is, in making a clinical diagnosis, a group of symptoms should be correlated as far as possible as arising from some one point, instead of segregated; resulting in a diagnosis frequently announced in the secular press as a complication of diseases, with too often a complication of treatment.

HYPERACIDITY.*

By GEORGE ROE LOCKWOOD, M.D.,

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A SHARP line of distinction is to be drawn between hyperacidity and hypersecretion.

Hyperacidity may be defined as an abnormal increase in the HCl. acidity during the digesting period, the phenomenon disappearing as soon as the stomach empties itself. The fasting stomach is empty.

In *hypersecretion* we have a continuous flow of gastric juice, both in the fasting state and in the period of digestion far in excess of the quantity required. The fasting stomach contains a fluid giving reactions for free HCl.

These two conditions are often combined. The majority of hypersecretions are hyperacid, but, on the other hand, hyperacidity exists frequently enough without any hypersecretions at all. It is of these cases that I would speak, in which simple hyperacidity is shown by an abnormal percentage of HCl. during the digesting period, and in which the fasting stomach is empty.

Hyperacidity is a symptom—not a disease *per se*, and this cannot be too strongly emphasized. As a term it is as indistinctive as "fever" or "bronchial breathing." It is surprising how often this simple truth is overlooked and patients are diagnosed as hyperacidity or hyperchlorhydria that are really examples of gastric or duodenal ulcer, of cancer, of muscular insufficiency of the stomach wall, or of appendicular or gall bladder disease without any apparent attempt at a more accurate classification.

The *frequency* of hyperacidity has been variously given by authors; 75 per cent. of all indigestive cases by Jaworski, 50 per cent. by Einhorn. Friedenwald in Baltimore found hyperacidity in 63 per cent. of 2,000 private patients examined. Coming down the list Fenwick writes that 9.2 per cent. of his private cases, and 4.8 per cent. of his hospital cases gave evidence of this disorder.

In my own experience in private practice 17.4 per cent. of indigestion cases showed hyperacidity associated with hypersecretion, while but 13.8 per cent. reveal hyperacidity alone without any increase in the quantity of the gastric juice either in the fasting or in the digesting period. My experience at Bellevue Hospital leads me to the conclusion that hyperacidity is about one-half as common in hospital cases as it is in private practice.

In private patients in New York and neighboring cities the limits of normal acidity range from 50 to 70 and it is only when this latter figure is passed that we may regard the gastric contents as abnormal. In hospital cases the normal acidity is somewhat lower, ranging between 50 and 60. These figures apply only to the Ewald test break-

fast. For ordinary meals and test dinners which include meat, at least ten points must be added.

Etiology.—Dietetic errors of various kinds have been and are still generally considered the most prolific cause for hyperacidity. This I cannot verify. In my cases the effect of diet has been practically negligible. Were dietetic errors as frequent a cause as has been supposed, hyperacidity would be more common in hospital than in private cases, whereas the reverse of this is true. In the light of recent scientific investigation we are forced to admit that the influence of diet in producing this disorder has been greatly overestimated. Pawlow, Hertz, and others have found that the direct contact of the interior of the stomach with irritating food, drugs, acids and other forms of direct stimulation does not in the least influence the flow of gastric juice. "The mechanical stimulation of the stomach by food thus calling forth the secretory work of the glands," says Pawlow, "is a sad misconception."

I cannot see that my patients with hyperacidity have been any more indiscrete in diet than in a similar number of patients whose digestion is without flaw or blemish.

It is well on general principles to insist upon the importance of simple and wholesome food, and upon its thorough mastication, but I am firmly convinced that more harm than good is done by over-dieting the patients and restricting them to food that is insufficient and unappetizing.

The influence of the nervous system on gastric digestion is generally well recognized, and it is a known clinical fact that hyperacidity is a concomitant symptom of neurasthenic and psychasthenic states. Psychic influences frequently induce an attack in nervous individuals; worry, undue excitement or outbursts of anger are important etiological factors in the production of this ailment. Patients with broad costal angles are as a rule not susceptible to these influences, but those with sharp costal angles and the other stigmata of the enteroptotic state are especially liable to this disorder, and it is in these enteroptotic patients that the production of hyperacidity after nervous strains and worries seems most regular and certain.

I have no desire to minimize the importance of nervous strain and of lowered nerve vitality as causes for hyperacidity, but I cannot accept the theory that these neurasthenic and psychic influences allow of an uncontrolled excitability of the secretory nerve supply of the stomach that is evinced by the over-production of HCl. It would seem far more probable that these conditions of lowered nerve tone are accompanied as part and parcel of the symptom-complex by myasthenia or atony of the gastric wall, and that to this atony the hyperacidity is due. Further reference to this point will later be made.

I have analysed carefully the conditions found in my hyperacid cases, and place before you the following table:

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

In cases of hyperacidity

Gastroptosis was present in 22.5%.

Gastric or duodenal ulcer was present in 19%.

Chronic appendicitis was present in 11.5%.

Atony was present in 11%.

Gall bladder disease was present in 5.5%.

Chronic acid gastritis was present in 5.5%.

Cancer was present in 4%.

Benign pyloric stenosis was present in 1%.

Unknown or functional was present in 20%.

It is therefore evident that a definite and assignable cause for hyperacidity can be found in 80 per cent. of all the cases. To group all these cases together under the general title of hyperacidity is quite inexcusable, and yet this is what is happening every day.

Further analysing these 80 per cent. of cases dependant upon an organic lesion it is quite evident that they all have one condition in common, namely, a motor error. 22.5 per cent. occurred with gastroptosis—a disease in which atony of the gastric wall is a prominent feature. An analysis of 233 cases of gastroptosis has shown that 9.5 per cent. show achylia, 8 per cent. subacidity, 55 per cent. normal acidity. 27 per cent. show hyperacidity. Further analysis has revealed the fact that the greater the degree of muscular atony the higher the acidity.

In gastroptosis with subacidity, marked atony was found in one-third the cases.

In gastroptosis with normal acidity, marked atony was found in one-half the cases.

In gastroptosis with hyperacidity, marked atony was found in two-thirds the cases.

Simple atony alone was found in 11.5 per cent. of cases. Adding these to the atonic gastroptosis cases I find in my cases of hyperacidity that 34 per cent. of the cases were thus associated with an atonic error.

Ulcer, gastric or duodenal, was found in 19 per cent. It may be accepted as a good working rule, and one which I have verified in my ulcer cases, that the nearer the ulcer is to the pylorus the greater is the acidity, the reason being that in these juxta-pyloric ulcers a certain degree of pyloric narrowing is found, either structural or spasmodic which interferes with food exit, and tends toward hyperacidity and continuous hypersecretion. Saddleback ulcers of the lesser curvature may also interfere with gastric motility and be attended by hyperacidity with or without hypersecretion. I believe that these are clinical facts capable of verification.

In the 5 per cent. of cases of hyperacidity with cancer the growth was pyloric in every instance.

In the 5 per cent. of cases due to chronic gastritis evidence of motor error and delayed food-exit was found in all but one instance.

Diseases of the gall bladder and appendix are commonly associated with hyperacidity.

30 per cent. of gall bladder cases are hyperacid.
30 per cent. of gall bladder cases are normally acid.

22 per cent. of gall bladder cases show achylia.

Moynihan, Patterson and others have demonstrated that in these chronic irritations of the midgut or its embryonic derivations a pyloro-spasm was frequently induced, causing delayed food exit and showing a tendency toward hyperacidity and hypersecretion.

Whenever food exit is delayed, there seems to be a tendency to hyperacidity. Simple atony does not seem to pass beyond this point, but delayed food exit from ulcer, cancer, gall bladder or appendicular disease may go into the second stage, namely, hypersecretion, as shown by presence of acid fluid in the fasting state.

The writer's estimate that 80 per cent. of hypersecretions are demonstrably due to motor error may seem somewhat high, but Graull (*Arch. f. Verdauung Kr.* XIII p. 627) finds hyperacidity in 50 per cent. of his cases of atony, while Kaufmann (*Zeitschrift f. Klin. Med.* 1905 Bd. 57 p. 491) makes a somewhat higher estimate.

In chlorosis I have not found hyperacidity unless the chlorosis is complicated by atony.

The remaining 20 per cent. of hyperacidities give no apparent cause for the ailment. In the great majority of these cases the hyperacidity ran an entirely latent course. The patients were not noticeably neurotic, nor did they commit dietetic errors so commonly described as casual factors any more than those patients whose digestion was without flaw.

SYMPTOMS.

In discussing the symptoms of hyperacidity it is important to distinguish between those cases dependant upon an organic lesion in the stomach or midgut, and those cases in which the hyperacidity may be considered primary or functional—for the reason that in the former group pain, pyrosis and heartburn may be due to the primary organic cause instead of being the result of having too great a HCl. concentration in the digesting state. I have accordingly separated my cases into two groups. In the first I have included cases of hyperacidity dependent on ulcer, gall bladder disease or chronic appendicitis or organic or functional pyloric narrowing. In the second group I have included the cases of hyperacidity dependent on atony gastroptosis as well as those cases in which no definite cause can be ascribed which for want of a better term we call functional. I will confine my remarks entirely to this latter group of cases.

The great majority of these cases gave no obvious symptoms of hyperacidity, the ailment ran a latent course as far as subjective symptoms were concerned and was only diagnosed by a routine examination of the gastric contents. Of heartburn, complaint was rarely made.

Heartburn consists of a burning feeling referred to the substernal or epigastric areas, usually radiating upward to the throat. Properly speaking it is not a pain, but a feeling of peculiar and characteristic distress. Such a heartburn in true hyperacidity should appear during the height

of gastric digestion and should disappear when the stomach empties itself. Heartburn appearing later than three to four hours after eating or persisting after this time suggests hypersecretion, and consequently an organic lesion in the stomach, the midgut or its derivatives. Should heartburn appear when the stomach is empty, such as in the morning before breakfast, a motor error of the pylorus, spasmodic or organic may be reasonably inferred. Heartburn in the cases without organic disease of the stomach, appendix or gall bladder, has rarely in my experience been sufficiently distressing to call for induced vomiting except in the case of intolerant neurasthenics who habitually empty their stomachs upon the slightest provocation.

Heartburn bears no relation to the degree of acidity. It may be present even in achylia, while acidities of 90 to 100 may be encountered that are unaccompanied by any distress whatever.

Pyrosis, or the raising of acid fluid, does not properly belong to simple hyperacidity but to hypersecretion—of which condition it is quite characteristic if it occurs at a time when the stomach should be empty. It was not present in any of the so-called functional cases.

Pain belongs entirely to the organic cases due to ulcer, cancer, pyloric stenosis, gall bladder or appendix. It is not present in the cases of so-called functional origin—at least in none of such cases have I ever heard it complained of.

The majority of writers speak of *pain* often to the point of agony. I would regard a pylorospasm due to one of the above mentioned organic causes, as provocative of the pain.

The presence of pain should be regarded as strong presumptive proof against the purely functional nature of any case of hyperacidity in question.

In conclusion I would suggest the following practical rules for diagnosis:

1. Do not make a diagnosis of hyperacidity until all organic lesions are excluded and even then be prepared, with a free and unbiased mind, to change the diagnosis to one that is more definite and distinctive, should other symptoms or physical signs arise.

2. Do not make the diagnosis of hyperacidity without examination of the fasting stomach by a tube. The presence of acid fluid, or of food remains or of any considerable amount of gastric mucous should exclude the diagnosis.

3. Do not make the diagnosis of hyperacidity simply because the patient is nervous and neurasthenic.

4. Do not make the diagnosis of hyperacidity should the previous clinical history suggest attacks that may point to appendicular or gall bladder disease, or should the physical examination suggest that these lesions are probable.

5. Do not make the diagnosis of hyperacidity accompanied by epigastric pain. Especially should this diagnosis be avoided if the pains occur at a stated and regular time after eating.

6. Do not make the diagnosis of hyperacidity if hemorrhage is present either visible or occult, in vomited matters or in the stools. Examination for occult blood in the stools should never be neglected.

7. Do not make the diagnosis of hyperacidity in cases with repeated vomiting, especially if vomiting be of the abundant acid fluid indicative of hypersecretion.

8. Do not make the diagnosis of hyperacidity if the symptoms occur when the stomach should be empty.

9. Do not make the diagnosis of hyperacidity in the event of the test breakfast settling into two layers, the supernatant fluid layer being twice or more the depth of the underlying sedimentary layer. These are cases of alimentary hypersecretion and not of pure hyperacidity.

10. Do not make the diagnosis of hyperacidity in cases attended by loss of appetite or by nausea or by advancing anæmia or by loss of weight, especially if the patient be of adult years with or without a previously good digestion.

11. Do not make the diagnosis of hyperacidity without mental reservation in those over forty-five who complain of this disorder for the first time.

A PLEA FOR EARLY DIAGNOSIS IN SURGICAL AFFECTIONS.*

By A. H. TRAVER, M.D.,
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IT is becoming more and more an age of specialists, and I think rightly so; for a physician who studies a special class of cases and sees a greater number of these cases, becomes more proficient in making a diagnosis or in performing the necessary operation, than the general practitioner who sees but one or two of these cases during the year.

There is a strong feeling among general practitioners that a doctor doing surgery should treat surgical cases only. A surgeon would not be expected to treat typhoid or pneumonia, for instance, yet the general practitioner treats appendicitis or tumors and decides for himself when it is necessary to refer the case to the surgeon for operation. Should the general practitioner treat cases of appendicitis or tumors, when every physician knows that there is no known medicine that has the least effect upon the growth of a tumor or an inflamed appendix, except perhaps physic to do it harm? Ought not major surgical cases to be treated, at least in consultation, with a surgeon? Is it fair to the surgeon to be called to see a case of appendicitis after peritonitis has developed, and so have a high mortality following operation;

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

or to have cases of cancer of the breast sent to him after the axillary glands have become involved, and so get a small percentage of permanent recoveries? Is it fair to the public to make them believe that cancer is sure to return, when it is not that it returns but rather that it has already developed so far at the time of operation that it cannot be completely removed? Is it fair to make people fear appendicitis operations because of their present too high mortality rate following operations, when you and I know that there is practically no mortality if operation is performed before the infection has spread beyond the appendix?

Dr. Wm. Mayo says: "The layman requires considerable explanation before he can be made to realize that the risk is not in surgery but in delayed surgery." Dr. Murphy says: "A case of ruptured appendix is one improperly treated, for it should have been removed before it ruptured."

It is seldom that a case of appendicitis dies following operation if the operation is performed while the infection is still localized within the appendix. In looking over my case records for the past thirteen years, I find but two cases which died following operation, in which the appendix was not ruptured at the time of operation. One case died of pneumonia, while the other case was operated on in a farm house some distance from his physician, and died suddenly about sixteen hours after operation. The cause of death was not known. The records also show that there were two physicians for whom I have operated on eighty-six cases of appendicitis with no mortality, while for a third I have operated thirteen times with four deaths. I am willing to admit that, in the eighty-six cases of appendicitis with no mortality, there may have been some in which an operation may not have been absolutely necessary, but in the case of the third physician there was no question about the necessity of the operation, as he did not refer the cases to me until the appendix was ruptured and peritonitis was developing. Let me ask you the question, which of these physicians would you prefer to treat your family, one who may be over anxious and have no mortality, or the one who delays operation until the appendix is gangrenous, and has one case in three die? Let me put the question in another way. If you had appendicitis would you have the operation performed early when there is practically no danger, or would you delay until there is danger of peritonitis, fecal fistula, intestinal adhesions, and possibly death? Dr. Richardson says: "Take a case of acute appendicitis; have we not demonstrated beyond dispute, what the progress is cannot be accurately told in any case, and has not the medical and surgical world become convinced, therefore,

that the only safe course is earliest possible operation?"

While on the subject of appendicitis, let me quote to you one year's mortality rate of appendicitis in the city of Berlin, showing the death rate in relation to the time elapsed before operation was performed.

Cases operated on within 24 hours—.09 per cent. mortality.

Cases operated on during the second day—7. per cent. mortality.

Cases operated on during the third day—10. per cent. mortality.

Cases operated on after the third day—22. per cent. mortality.

In view of these figures, one can hardly see how any physician can delay operation when less than one case in one hundred die if operation is performed during the first 24 hours, while if operation is delayed until after the third day, 22 cases out of each 100 die. Would you wait if it were one of your family who was suffering with appendicitis?

Another condition in which early diagnosis and early operation is imperative is acute intestinal obstruction. In this condition, as in acute appendicitis, the greatest harm is done by the administration of cathartics. In a suspected case of acute intestinal obstruction stop all food by the mouth, wash out the lower bowel, feed by nutrient enemata, and carefully examine your patient. You may find a small hernia which has become strangulated and is causing the obstruction, or you may find that the patient may have had previous attacks of peritonitis, or had a previous operation which would point toward intestinal adhesions. But if you are in doubt, have exploratory operation performed. If surgeons with the experience of the Mayos or Ochsner find it necessary to make exploratory incisions in order to arrive at a definite diagnosis, we surely should not think it a disgrace to do likewise. One cannot emphasize this truth better than has Dr. Ochsner, so I will quote from his "Surgery." He says: "A statement which should be repeated many times and always regarded when any form of intestinal obstruction is considered, and even when there is the slightest suspicion of the possibility of the existence of intestinal obstruction in any given case, is that it is absolutely unpardonable to give either cathartics or any form of nourishment by mouth. In our own experience the mortality has been ten times higher in patients who have been given cathartics before coming to the hospital suffering with intestinal obstruction, than in those who have received none." So instead of waiting and giving strong cathartics, thereby destroying the vitality of the intestine, carefully examine your patient to determine if obstruction exists, and, if there is any suspicion of its existence, have operation performed early. If you find an obstruction

present you can save your patient; if you find you have been mistaken, you have done your patient no great harm. I would rather admit that I had operated when it was not necessary than to admit that my delay was the cause of the patient's death.

Cancer of the breast is another condition in which early diagnosis is very necessary. While it is not necessary that a diagnosis be made within 24 or 48 hours, as in the case of acute intestinal conditions, yet it is essential that diagnosis be made before the lymphatic glands become involved.

All surgeons have had cases referred to them with a history as follows: "Mrs. A. first came to me about six months ago with a small tumor of the breast. Since then I have examined her several times in the endeavor to determine whether or not it was a cancer. I now find the axillary gland slightly enlarged and I think an operation is necessary." The physician has arrived at a correct diagnosis, but in his delay in endeavoring to arrive at too exact a diagnosis, he has allowed to pass the favorable time for operation. All tumors of the breast are dangerous and a large percentage are malignant. Dr. Parker Syms says: "The time has passed when the doctor, in his ignorance, may advise his patient that a tumor of the breast is of no significance unless it shows active signs of malignancy." Dr. Ochsner says: "Accepting the general statement that there is a tendency in all tumors of the breast, with the exception of lipoma, to become malignant later in life, it consequently seems wise to remove every benign tumor in this locality as early as possible after it has been diagnosed. The operation is safe, it does not inconvenience the patient and may relieve her of a very serious danger."

Dr. Judd says: "One-half of the cases that come to operation come too late because they are being watched by their home doctors." In waiting to make a positive diagnosis, we make it impossible to cure over 25 per cent. of the patients, while, if operated on early, all cases of non-malignant tumors are cured, and, approximately 85 per cent. of the malignant." He also states that 85 per cent. of all tumors of the breast are malignant to begin with, and, it is estimated, that one-half of the remaining 15 per cent. will become malignant if the patient lives.

Let us keep these figures in mind and when the next case of tumor of the breast comes for examination, let us decide if it is safe to delay operation in view of the fact that 80 to 90 per cent. of all breast tumors are malignant, and that in a case in which a clinical diagnosis is positive, it is not a case in which operation can promise much, as only 25 per cent. can be cured with the most radical operation when the axillary glands can be palpated. But it is for the suspicious case that operation can

promise much, for, if it is cancerous, 80 per cent. can be cured; and even if it proves to be non-malignant, they are better out, for what guarantee have we that they would not become malignant if left in.

The census report shows that cancer of the breast caused 7,000 deaths in the United States in the year 1910. In view of this horrible mortality we, as physicians, must endeavor to do something to reduce this scourge. As for myself, I think that the operation for cancer of the breast, as it is performed today, is about as thorough as it ever can be done, so little can be hoped for in the direction of reducing the mortality by a more complete operation. Or to use Dr. Murphy's words: "If there is any hope to be expected from operation for carcinoma of the breast beyond what we now realize, it is this, that we must recognize the tumors earlier and remove them promptly."

Great good can be done if patients can be made to consult their physicians as soon as a tumor is discovered and if their physicians would advise that every breast tumor be removed at once. How can patients be made to consult their physicians as soon as the tumor is discovered? *First*, teach the public that 80 per cent. of all breast tumors are cancerous, and that all tumors that are not cancerous, are cured by operation, and, even if they are cancerous, 85 per cent. can be cured if operation is performed early. *Second*, let the public know that the reason why cancers return is not so much that they return, as it is that, at the time of operation, they have extended so far that they cannot be completely removed.

How can physicians be made to send their cases for early operation? Repeat it again and again that all tumors are better out, that about 80 per cent. of tumors of the breast, for instance, are cancerous, but about 85 per cent. can be cured if operated on early, while only 25 per cent. can be cured, if operation is delayed till the glands are infected. Would it not have a good effect if the surgeons refused to operate on the far advanced cases of cancer; for by so doing, the physician would learn that the cases must be sent early if operation is to be performed, and the public would blame them if they delayed, and at the same time, patients would learn that they must take their physician's advice to have operation done early, for there is little hope of recovery by a late operation. By so doing our percentage of *Returns* would be greatly reduced and patients would soon learn that a cancer is not a hopeless condition if attended to early.

The way in which the public has awakened to the necessity of some active measures to stop the spread of tuberculosis clearly demonstrates its willingness to co-operate with physicians in measures to improve the

public health. Would it not be good to bring to the attention of the public, by magazine and newspaper articles, that the U. S. census shows that in 1910 cancer of the breast caused 7,000 deaths; that cancer of the genito-urinary organs caused 11,000 deaths; that the New York State health reports show that cancer caused 8,000 deaths in this state during the year 1911? If these facts could be generally known would not the public awoken to the fact, as they have in tuberculosis, that the case must be treated early in order to give any hope of recovery?

The largeness of my subject of necessity prevents my speaking of all the surgical diseases in which an early diagnosis is of the greatest benefit, but I have chosen a few of the more common diseases in which a delayed diagnosis causes the greatest danger to the patient. I have not said any new thing in this paper, and probably nothing, but what you already knew, yet I have endeavored to bring known facts to your attention in such a manner as to make you appreciate that it is the general practitioner who usually sees the case early, and on him rests the responsibility of making an early diagnosis or, in case of doubt, the necessity of calling consultation to aid in arriving at an early diagnosis for it will be by earlier operation rather than by more radical operation that we can do more to reduce the death rate in surgical diseases.

THE ONLY OR FAVORITE CHILD IN ADULT LIFE.*

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VERY little attention has been given to the problem of the only child, and the little literature we have at our disposal deals mainly with the superficial and general aspects of the question. Neter, who has written an excellent pamphlet on the subject¹, gives a very good description of the only child's attributes, but he does not enter into the deeper psychological elements. Moreover, no attempt has been made outside of the Freudian school² to follow those children into adult life and to trace the individual influence at play in their adjustment to environments. This can be readily understood when we remember that very little has been done in child psychology in general, and that only few psychologists are at present occupying themselves with the subject.

Stimulated by the works of Freud³ and Jung⁴ I have investigated the subject from the psychoanalytic side, and shall endeavor to present to you some of the results. But before proceeding to do so it will be necessary to orient ourselves on

some of the psychological principles that form a part of our discussion.

Of the many interesting and valuable discoveries furnished to us through psychoanalysis none is as important as those facts which treat of the individual's relation to the family and society. Studies made of psychoneurotics amply demonstrate that contrary to the accepted opinions neurotics are only exaggerations of the normal individual and that the modes of reaction in both are about the same. The only difference lies in the fact that one can adjust himself to his environments while the other finds it difficult or impossible to do so. If one should ask wherein these difficulties lie the experienced psychoanalyst would readily point to the parents. Indeed, the more we study the psychoneuroses the clearer it becomes that the most potent factor in their determination is the early parental influence.

In his famous essay *Concerning Human Understanding*, Locke tells us that the child's mind is essentially a *tabula rasa*, a tablet upon which nothing is written, and that all knowledge rests on experience. Psychoanalysis fully demonstrates Locke's empiricism, and confining ourselves to the question of parental influences and relationships we may say that every individual's mind possesses certain stereotype plates or models, as it were, which are the result of mental impressions produced by the parents during childhood. Thus a father-image⁵ and a mother-image remain permanently engraved in the mind and act as standards for estimation of men and women that later enter into this person's life. It is not difficult to show that our behavior towards our fellow beings depends mostly on our relations to our parents. In other words we unconsciously endeavor to fit every stranger into one of our latent parental images and our likes and dislikes depend in a great measure on the success or failure of such correlation. Further investigation shows that children do not always love their parents as is commonly supposed but very often hate one of them. The first woman the little boy loves is his mother, and the first man the little girl loves is her father. The little boy idolizes his mother and supplies her with that part of poetic love which she no longer gets from her husband. The mother calls her little boy sweetheart and tries to realize in him her ideal of the man. The same thing takes place between the little girl and her father. Normally, however, these parental ideals vanish with the advancing age when the growing child begins to project his love on strangers. The boy then no longer thinks that his mother is the prettiest and loveliest woman in the world, but he evinces an interest in other persons of the opposite sex. The deflection of love from the mother may also be furthered by the appearance of a little brother who claims a part of his mother's love and attention. However, this absence of the mother

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ideal is only apparent, it is not eliminated but repressed into the unconscious and there it continues to exert its influence throughout the whole life of the individual. Psychoanalysis of normal persons shows beyond any doubt the enormous influence of unconscious parental complexes. It explains the important mechanism of transference⁶ as well as many of the peculiarities of the love life⁷.

A few weeks ago I was consulted by a young girl of 21 years who was said to have become nervous as a result of a disagreement with her mother. She was in love with a man of 46 years to whom her mother strongly objected not only on account of the marked difference in their ages but because the man was considered mentally abnormal. During our conversation she remarked that her mother has always been in her way, and by way of explanation she stated that her mother was jealous of her and that when she was younger she hated to have her mother go along when she went out with her father. "I always looked upon her as a stranger." She idolized her father who is her ideal in every respect although he is a paranoiac and has been for years in an insane asylum. She surprised me when she told me that there is as marked a difference in the ages of her father and mother as there is in her own and her fiancé's ages. Indeed, all the features of the case unmistakably pointed to an identification with her mother and an unconscious desire to get her father ideal.

Such cases are not at all uncommon. I could cite any number of examples.

From what has just been said it can be readily understood that such parental influences may often be strong enough to inhibit materially the individual's relations to the other sex. Thus too much and prolonged affection on the part of the mother is apt to cause an undue conscious or unconscious attachment to the parents and thus prevent the child from going through the various stages of its psychosexual development. For we know that the sexual impulse of childhood is autoerotic or objectless⁸. The child knows no other sexual object than himself and gets his gratification through the erogenous zones of his own body. As it grows older we have the so-called latency period during which the greater part of the sexual excitation is utilized for aims other than sexual, viz., for the formation of social feelings and the future sexual barriers. This is the so-called process of sublimation. Between autoerotism and the object love there is an intermediate stage which has been designated as narcissism. It consists in the fact that the developing individual while collecting into a unit his autoerotic sexual impulses in order to gain a love object, takes first himself, his own body, as the object love before going over to the object selection of a strange person. Freud tells us that every stage of development

of the psychosexual life offers a possibility for "fixation" which may result in a type of character. Thus we know that fixation in narcissism may cause paranoia⁹ or homosexuality and that fixation in autoerotism may lay the foundation for dementia præcox. By giving the child too much love mothers often prolong or cause a fixation in the various stages mentioned. This naturally occurs very often in only children who, having no one with whom to share their parents' affection, are overburdened with love. The same takes place in favorite children who are subjected to the same conditions as only children during the impressionable period of their existence. Since the fall of 1908 I have examined 400 only or favorite children and my findings may be divided into (a) general and (b) specific.

(a). Whether *burdened by heredity or not* the adult only child usually shows one prominent feature, namely, he is a very poor competitor in the struggle for existence. Having been carefully reared and constantly watched by his loving mother he remains forever "mama's boy." He is devoid of those qualities which characterize the real boy, he lacks independence, self-confidence, and practical skill which the average boy acquires through competition with other boys.

Owing to the fact that the only boy constantly associates with grownups he is usually precocious even in childhood, and as he grows older he finds it very hard to associate with people of his own age. I know an only boy of 19 years who has not a single friend, he is practically asocial. He wishes to associate only with people much older than himself and cannot adapt himself to the society of young people because "they bore" him. Some time ago I was consulted about another only boy, 7 years old, because as his mother put it he did not get along with other children, and because he was a real blasé. He was not interested in anything; toys, pets, books, etc., etc., that would have been sufficient to delight the hearts of a dozen children had absolutely no charm for him. He was in constant need of new excitements and as they could not be supplied quickly enough he was unhappy and morose.

The only child is usually spoiled and coddled because the parents gratify all his whims and have not the heart to be severe with or punish him when necessary. This has its evil consequences in adult life for the slightest depreciation hardly noticeable by the average person is enough to throw him into a fit of depression and rage lasting for days and even for weeks. An only daughter attempted suicide because her best friend received more attention than she at a social gathering.

It is due to the undivided attention and abnormal love that the only child gets from his parents that he develops into a confirmed egotist. He is never neglected in favor of sisters and brothers, he is the sole ruler of the household, and his praises are constantly sung, it is there-

fore no wonder that the only child becomes vain and one sided and develops an exaggerated opinion of himself. In later life he is extremely conceited, jealous and envious, he begrudges the happiness of friends and acquaintances and he is therefore shunned and disliked.¹⁰ A favorite son, a bachelor of 62 years, a wealthy retired merchant, told me that whenever there was a rise in the market he suffered from severe depression and fits of envy simply because he knew that some of his friends would make some money. He himself had no personal interest in the market. Such qualities are surely not conducive to happiness, and it is not at all surprising that almost all such children are selfish, unhappy, and morose.

(b). The specific findings are of still greater interest. Of the 400 cases observed there were 172 men and 228 women, their ages ranged from 18 to 68 years. The morbid manifestations were as follows:

The predominant feature in about 36 per cent. of my cases was the abnormal sexual life; most of them sought treatment for homosexuality, psychic impotence (men) and sexual anasthesia (women); there were also some exhibitionists, voyeurs, sadists, and masochists. About 18 per cent. suffered from the various types of dementia præcox, and the rest represented the different forms of the psychoneuroses.

No statistical conclusions should be drawn from these figures, as most of these patients came or were sent to me for treatment because they suffered from psychoneuroses or from the other maladies enumerated above; they show, however, the marked prevalence of only or favorite children in these classes. Bearing in mind our psychoanalytic knowledge of sex this is not at all surprising. The child is born with the germs of sexuality and during the first years of its life is polymorphous perverse. That is, if an adult should manifest any of the sexual activities that we see in the child he would be considered perverse. But as the child grows older most of these perversions undergo repression and the rest is subjugated to the primacy of the genitals which serve the purpose of procreation.¹¹ It is quite obvious that abnormal love in early life hinders the normal sexual evolution, it either keeps alive or later revives some of the early sexual activities. The boy cannot transfer his libido on other women because his mother stands in his way. As a rule this is accomplished quite innocently under the guise of maternal care. Such mothers discourage social intercourse with the opposite sex because they wish to preserve their sons' purity, etc. A number of my homosexual patients told me that their mothers were actually jealous of every woman with whom they chanced to come in contact, and behaved exactly as if they were confronted with a rival. No one is good enough for such children, at least that is what the parents think. This, by the way, is one

of the secrets of mothers-in-law. They unconsciously want their sons for themselves and are jealous of every other woman. It is a sex jealousy pure and simple. The majority of only children do not marry at all or they marry some near relative whom they unconsciously identify with their parent image.¹² The *probable average* of my patients' ages was 34 years, but only 93 out of the 400 had been married. Most of them remained old maids and bachelors.

With the brief time at my disposal I am unable to enter into any psychological explanation of these different perversions, and I must therefore presuppose a knowledge of the Freudian literature on your part. I merely repeat that parental influences play a great part in both the normal and the neurotic individual, but whereas the normal person gets away at least consciously from these dominations the neurotic remains anchored and succeeds only partially in freeing himself from them. This fixation is mainly responsible for psychic impotence, frigidity, and homosexuality¹³ and its general influences can always be found in every psychoneurotic.¹⁴ I know an old bachelor of 45 years, an only son, who slept with his mother until she died 4 years ago. He is a good business man and is said to be normal in every other respect. I have treated an old maid, a favorite daughter, who lost her father 3 years ago. She still wears black and cries bitterly at any allusion to her father. She answered as follows my question why she still wore mourning: "Why shouldn't I? No one has ever had such a kind, generous and self-sacrificing father, there is not another man like him in this world. O! how I love this man, etc." This may sound like pure filial love, but having analyzed her I have definitely ascertained that she loved her father as any woman loves a stranger. We can readily see why such persons cannot marry. This patient characteristically expressed it when she said: "If I could find a man like my father I would marry."

Just a few words on prophylaxis. Of course it would be best for the individual as well as the race that there should be no only children. However, when this cannot be avoided by virtue of ill health or death of one of the parents the child need not necessarily become a neurotic and belong to any of the categories mentioned above. It all depends upon his subsequent bringing up.

When we read the history of only children we find that only those who have been brought up wrongly develop into abnormal beings, those who are not pampered and coddled have the same chances as other children. As classical examples we may mention Nero and Confucius, the former was a spoiled only child, while the latter was a well-bred only child. An only child should be made to associate with other children who will soon teach him that he is not the only one in the world. This should begin at a very early age. I have seen many "nervous and wild"

only children who were completely changed after a few weeks' attendance in a kindergarten or public school. But what is still more important is that only children should not be gorged with parental love. Parents should take care that such children should not develop an exaggerated idea of their own personality and think that they are superior to everybody. For individuals imbued with such paranoid ideas are bound to come into conflict with their fellowmen. What is true of the individual may also be true of a race and history furnishes us with a very nice example.

I refer to the only and favorite child of Jehovah, the Jewish race. The Bible tells us that the Jews are the "chosen people," "the only son," and even "the first born." That the Jews have displayed all the attributes of the only or favorite child need hardly be mentioned. From the Bible we learn that they were stiff-necked, spoiled, and overbearing, and considered themselves superior to every other nation. Characteristics of such nature have been attributed to them by almost all writers of ancient and modern times, and although some are gross exaggerations it must nevertheless be admitted that they are essentially correct in reference to the Hebrews of antiquity, and the modern orthodox Jews. Still it is gratifying to note that this no longer holds true of the great bulk of western Jews who have enjoyed a couple of generations of freedom. The explanation of this change is given by Dr. M. Fishberg¹⁵ in his very interesting book. He plainly shows that "Judaism has been preserved throughout the long years of Israel's dispersion by two factors: its separative ritualism, which prevented close and intimate contact with non-Jews, and the iron laws of Christian theocracies of Europe which encouraged and enforced isolation." In other words, as long as the Jew has been imbued with the racial pride of belonging to the "chosen people" and has been offering daily prayers to Jehovah because he was not created a Gentile he perforce remained exclusive and therefore was suspected and disliked by his non-Jewish neighbors. When we study the history of the Jews we find that their enforced isolation was the result of an early, voluntary clannish exclusiveness. This shows the striking analogy to the only boy who at first refuses to associate with others because he believes that he is superior to everybody else, and who is later excluded from social relations because he is misunderstood and disliked. Dr. Fishberg also tells us that as soon as the barriers are removed the Jews readily assimilate and all former prejudices disappear. The only boy, too, loses his identity as soon as he realizes that he is no better than his fellow beings.

The problem is more complicated when we come to prophylaxis in reference to psychosexuality and I regret that I am unable to discuss it here. I shall merely say that parents should remember that proper sex regulation does not

necessarily mean repression and extermination of all sex feelings, and that the requisites for perfect manhood and womanhood are all the impulses and desires that are normally common to men and women.

In conclusion I wish to say that the only child is a morbid product of our present social economic system. He is usually an offspring of wealthy parents who, having been themselves brought up in luxury and anxious that their children should share their fate, refuse to have more than one or two children. By their abnormal love they not only unfit the child for life's battles but prevent him from developing into normal manhood, thus producing sexual perverts and neurotics of all descriptions.

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TOXAEMIA OF PREGNANCY; A CONSIDERATION OF TREATMENT.*

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A DEQUATE consideration of the treatment of any disease involves the prophylactic as well as the curative, and the effective application of the principles of therapeutics to any condition is founded upon an accurate knowledge of its etiological and pathological elements, and

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is influenced in no small degree by a recognition of the fact that the course of any disease may be modified by varying conditions that obtain in the individual host, and by cultivating a readiness to meet those modified conditions in a way best adapted to their relief.

A careful consideration of the individual manifestations in each case and the treatment of such case on its own evidence under the general rules of type, cannot fail to increase our efficiency in the control of disease, and especially is this true of the toxæmia which occurs during pregnancy.

While it is most important to give careful study to the work and investigations of others and to apply their results when indicated, the writer wishes to protest, in the best interest of the patient, against the blind application of treatment to these cases without an exhaustive investigation of the personal characteristics of the case in hand.

The general plan of treatment of the toxæmia of pregnancy has varied at different times. Some have taught that the uterus should be evacuated at the first sign of impending eclampsia, while others would forget the pregnant uterus and treat merely the symptoms. At the present time the pendulum of therapeutics tends to swing toward the latter plan; at least the emphasis seems to be on medical treatment first.

Now, in this condition (as in any other), it may be considered unscientific and is usually ineffectual to treat the symptoms alone without due thought of their cause, although it must be admitted that it is natural, when dealing with a disease which has some dramatic or sensational manifestation, such as eclampsia with convulsions, to have our attention centered upon that one symptom and so lose sight of other important points which should be receiving our care at the same time, *e. g.*, in the past it was thought that the convulsion was what killed the patient. We were taught to control the seizure at all cost and many poisons, such as chloroform, morphine, hyoscin, chloral, etc., were added to those already in the circulation. We now know that some of those drugs merely added to the damage already done.

In approaching the subject of treatment of the toxæmia of pregnancy we are confronted with the fact that there is no exact or positive knowledge of the source or nature of this toxin.

In the absence of that definite knowledge and with no working basis but fanciful and often conflicting theories which range through the realm of speculation, from a specific toxin arising in the placenta to some uncertain alimentary poison; from a disturbed liver metabolism and perversion of enzymes to a renal defect; from an absence of thyroid secretion to a retention of chlorides it is not an easy task to prescribe a scientific prophylaxis.

At best our efforts must be curative more often than preventive, but a careful study of the path-

ology of these cases and of the experiments that are going on in laboratories all over the world takes us a long step forward both in the cure and in the prevention of this dread condition.

While we are without knowledge of the definite toxin we must be without a specific antidote. However, the pathologist has shown that this poisoning results in a marked protoplasmic degeneration throughout the various body tissues and that it is this cellular lysis, taking place in the important organs of the body, such as the liver, kidney, heart, brain, etc., which accounts for the extreme gravity of this disease. This fact suggests that a well-balanced and sustained elimination is of the first importance in preventing such cell destruction, and at the same time maintaining tissue balance with the least possible expenditure of energy on the part of those organs.

It has long been known that there is a marked reduction in the urea elimination in these cases of toxæmia, but Ewing, Williams and others have shown that, while the total nitrogen output may be diminished, the relative proportion of ammonia may be very large and have suggested that a proportion of 10 per cent. of ammonia nitrogen is an indication for a termination of the pregnancy.

Those who have followed the work of Folin and other physiologists will realize that this large output of ammonia, acetone, etc., takes place in cases of severe starvation and is an evidence of great tissue waste. In eclampsia, pernicious vomiting, etc., the high ammonia co-efficient is not the direct but the indirect effect of the toxin and if we can find some way to prevent further cell destruction and at the same time provide suitable food we may expect a great advance in the treatment of this trouble. The physiologists are making progress in their work and it behooves us to give that work a fair test at the bedside.

Those who had the good fortune to listen to the Carpenter lecture at the New York Academy of Medicine last October, by Dr. Loeb, have doubtless thought with what force the experiments which he described, may be applied to the solving of the question of treatment of various toxæmias and that they may ultimately be of great value in indicating the nature of the poison itself.

In brief his experiments seem to prove that the various tissue cells will rapidly disintegrate in the absence of the proper proportion of sodium, potassium and lime salts in the circulating fluid; the normal ratio being 100 molecules of sodium, 2.2 molecules of potassium and 1.5 molecules of lime. Any marked departure from this proportion is followed by a more or less rapid degeneration of protoplasm.

The explanation of this is that, while the cell structure contains none of the salts, their presence in the proper ratio in the fluid which surrounds

the cell results in a protective action on the cell membrane. This protective process he calls "tanning" and to it he ascribes the maintenance of a stable metabolism within the cell. It seems that the chief factor in maintaining this protoplasmic equilibrium is the antagonistic action between the lime salt and the sodium and potassium.

Whether, in the absence of the lime, the others act as a direct poison, or the deficiency of lime weakens the protection of the cell and so allows a direct attack on the protoplasm by some other toxin, or whether the absence of this tanning process on the cell wall permits of an unstable diffusion of fluids in the cell has not yet been determined.

In the stress of work and time I have not been able to find the proper authority for statements that in these cases of toxæmia there is an increase of sodium chloride and also that there is an absence or deficiency of calcium chloride.

Whether this increase of the sodium or the decrease of lime in the blood, is apparent or real I do not know, but I have recently tested this theory in one case where the result, if due to treatment, was most remarkable. Of course I am unable to say whether the very rapid cure of this case was the direct result of, or was merely coincidental with the treatment, but I feel that you are entitled to have the history of it at this time though I hope to be able to work it out in a more scientific manner at some future day.

E. P. Age 24. Married. White. American. Primipara. Family history is negative. Her menstruation began in her thirteenth year with a twenty-eight day interval, was moderate in amount for six days and with slight pain. Her last menstruation began on September 7, 1911, but as she was not married until September 20th, it is assumed that conception took place just prior to the October period. In November, while visiting in another part of the state she had an attack of vomiting which lasted several days. She was then quite well until late in December, when the vomiting recurred, but with less severity than the first time.

In January, 1912, after about three weeks of comfort the vomiting began again and was very severe for about a week. Twice during this week there was a considerable amount of blood in the vomitus. In February the attack was of shorter duration, but very severe. She was then better for about a week, when the vomiting returned, and was almost continuous until March 13th, when I saw her. She was unable to retain anything by mouth. There was a moderate amount of albumin in the urine, but no casts.

On March 16th, when she was removed to the hospital, her temperature was 99.4; pulse, 120. Mouth was parched, lips cracked and bleeding. She was restless and complained of severe pain in the epigastrium, and the vomiting continued at intervals of about an hour. The vomitus

usually contained about three ounces of dense green fluid.

For the first twenty-four hours in the hospital she was given slow proctoclysis of a normal solution of cane sugar. This was well retained and her thirst was in a measure relieved, although the emesis continued and at times the pain in the epigastrium was severe. The sixteen ounces of urine in a twenty-four hour specimen contained a large amount of ammonia and acetone.

The rate of the pulse increased, but the quality was good and the blood pressure remained at about 135 mm. all of the time.

Nutritive enemata of peptonized milk were given at three hour intervals and were well retained. The vomiting continued and at times contained a moderate amount of blood. On March 20th the pulse reached 160, was much weaker, and at times irregular.

On the morning of March 21st thirty grains of calcium lactate were dissolved in hot water and added to the nutritive enema every two hours. During that day she complained more or less of nausea, but vomited only once, a small amount of mucus.

From that time her convalescence has been rapid, and she is now on a more or less general diet.

Whether this disproportion of salts in the blood is due, as some have claimed, to an over-consumption on the part of the fœtus or to a precipitation of the lime by some special toxin, is uncertain. In any event, the addition of lime to the treatment is a simple matter, and the theory is worthy of a fair and more scientific test.

In that phase of this condition in which the predominating symptoms indicate a profound central disturbance, shown by marked hypertension, convulsions, coma, etc., our treatment must be more active and have the definite aim of preventing any further cell destruction and, at the same time, of maintaining what tissue function has not been destroyed.

In attempting to accomplish this we must bear in mind that our patient is already in a state of more or less shock and in a bad condition to withstand the added burden of an anesthetic or a prolonged or severe operation. That desire which we all have to remove the basic cause of the trouble, the pregnancy, should be tempered with conservatism. Many patients have been sacrificed by injudicious haste in emptying the uterus.

A thorough washing of the circulation is, it seems to me, of primary importance in the protection of the patient. The delivery, I believe, should be a secondary consideration, though this ought not to be delayed too long if the patient is anywhere near term.

To wash the blood stream, I make use of all of the regular methods of catharsis, hot packs, or even venesection and replace the fluids so withdrawn from the circulation with a solution of

sugar. I can see no reason why a right proportion calcium salt may not be added to the solution for hypodermoclysis or intravenous infusion.

It has been suggested that the sugar solution be made with dextrose instead of cane sugar. This would save the time and labor which an already damaged liver requires to divide the cane sugar.

With your permission I will relate one case of this type which has several interesting points. You will notice, in the first place, that the patient suffered an added shock, that was nearly fatal, by the addition of *veratrum viridi* to the other poison from which she was already suffering; secondly, that while in this condition of extreme physical depression and with a blood pressure below 90 mm. she had a profound eclamptic seizure, and also that the intravenous infusion restored her to immediate convalescence.

J. C. Age 23. White. Married. Primipara. Family history negative. Menstruation began at age of thirteen, with a thirty-day interval, and was of two to four days' duration, with moderate flowing and some post menstrual pain.

Pregnancy began in July, 1910, labor being expected in the latter part of April, 1911. During gestation she was troubled with some œdema of the feet, but has had no headache, vomiting, or vertigo. Heart and lungs are normal. Abdomen is oval in form and muscles firm, with the fundus 5 cm. below the ensiform. Fœtal heart is heard at the left and below the umbilicus. Is loud and rate 170. Presentation is vertex in the O. L. A. position. The pelvis measures 22 cm. between the spines 27 cm. at the crests, with an external conjugate of 21.5 cm.

Urine is amber in color, acid, and ten-thirty sp. gr. A trace of albumin, but no sugar or indican. Sediment contains red blood, pus, epithelium and hyaline casts.

Blood pressure is 130 mm.

Labor began April 16, 1911, at 11:15 in the morning. She was admitted to the ward in the early afternoon, and an examination at 2 o'clock showed the vertex in the O. L. A. position. Contractions five to three minutes apart lasting twenty to thirty seconds. Head high. Fœtal heart strong, 160 to 170.

The cervix was obliterated, and the os dilated about three fingers. The membranes ruptured spontaneously at midnight, and the child was born at 4:10 A. M., April 17, 1911. Placenta delivered spontaneously at 4:27. Duration of labor, 17 hours.

There was very slight post partum bleeding, the cervix has a slight lateral tear and the vagina not injured. There was a moderate median laceration of the perineum which was immediately repaired with three silk worm sutures.

One hour post partum the mother's condition was good, pulse 70, fundus firm.

During the forenoon the mother was somewhat restless and vomited several times, but had no headache. At noon she had a convulsion. She was placed immediately in a hot pack, given magnesium sulphate by mouth and fifteen minims of Norwood's tincture of *veratrum* subcutaneously. At this time her arterial tension was 157 and the pulse rate 120. The convulsions continued at intervals of forty to fifty minutes. In one hour another fifteen minims of *veratrum* were given. At 2:30 the blood pressure was down to 90 and the pulse was very feeble at 58. Strychnine gr. 1/30 was given and repeated with no effect apparent. The pupils were dilated and her respirations were shallow and irregular. At 3 the blood pressure was between 80 and 85 and the pulse not easily felt at the wrist.

The median basilic vein was opened and about two ounces of blood escaped without force. While the vein was being dissected blood pressure reading showed about 80 mm. At this time the patient had a very severe convulsive seizure which lasted several minutes, and during which all pulsations of the heart seemed to stop. The canula was inserted into the vein and thirty ounces of warm saline were slowly infused into the circulation. The pulse gradually returned at the wrist, and when the infusion was finished the blood pressure was 118 mm. and the rate 70. The patient had become conscious and was talking.

There were no more convulsions, and her further convalescence was without event, the blood pressure remaining between 120 and 130 all of the time.

The baby was breast fed after the second day, and was four ounces over its birth weight when mother and child were discharged fourteen days after admission.

Those who are doing abdominal surgery and are familiar with the difficulty which we often meet in getting a free action of the bowels for some time after a severe abdominal operation, will agree that abdominal delivery is, often, not good treatment for eclampsia. Active catharsis is our most efficient means of elimination, and a cesærean section beside subjecting the patient to great shock will usually lock up the bowels for some time, thereby robbing you of this most valuable aid in your treatment.

My custom, in antepartum eclampsia, is to begin the circulatory washing by vigorous elimination and supportive treatment in the way of fluids, strychnine, etc., and, at the same time, induce labor if it has not already begun, hastening the delivery as rapidly as is consistent with proper protection of the patient from great shock.

ALOPECIA AREATA; ITS CAUSATIVE
FACTORS AND THERAPY.*By PAUL E. BECHET, M.D.,
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THE causation of alopecia areata is still only a matter of conjecture. No facts as yet have definitely proved whether this dermatosis is neurotic or parasitic. There has been recently, especially in America,¹ a preponderance of opinion toward the view that the disease presents two distinct varieties—the contagious or parasitic, and the non-contagious or trophoneurotic. Personally, after a careful perusal of the literature on the subject, I have come to the conclusion that the contagious variety is not a true alopecia areata, but a separate disease with an entity of its own and due to a specific bacillus allied to the seborrheic bacillus, but which is yet to be discovered, and that true alopecia areata is a trophoneurosis and not contagious. For instance, the returning hair in alopecia areata is almost always white, thin and slender. The returning hair from any parasitic affection of the scalp is always normal as to color and consistence. Alopecia areata is sometimes associated with other conditions neurotic in character, such as leucoderma (Besnier, Duhring, Dubreuilh, Thiberge, Feulard).² Eddowes, quoted by Stelwagon, reports a case of alopecia areata occurring on an area of leucoderma. Kingsbury³ presented three cases of total alopecia areata at a meeting of the New York Dermatological Society. All three showed errors of refraction co-existing with ocular muscular insufficiency. Dr. Kingsbury thought that total alopecia areata was due to a neurosis and that eye strain might be an etiological factor. There are many reported cases in the literature in which this dermatosis occurs after sudden nervous shock, from grief, fright, accidents, etc. Stelwagon⁴ reports the following case:

A man while driving a wagon at night was struck down by an overhanging bough of a tree, and fell on his head. Unconsciousness followed for several hours. Within ten days, a rapidly spreading alopecia areata developed, covering almost the entire scalp. The eyebrows and eyelashes were also affected.

Malcolm Morris⁵ reports a case of total alopecia areata occurring in a lady within forty-eight hours of receiving news of the death of her son. Stepp, quoted by Malcolm Morris, recorded a case of complete alopecia areata following a railroad accident. Cases showing the marked influence of nerve injuries in producing alopecia areata have been reported by Schutz.⁶ Boisser⁷ and Bidon⁸ report total alopecia areata following severe fright. I have personally been unable to trace any possible contagion in the majority of the cases seen at the New York Skin

and Cancer Hospital. In all reports of the contagious variety, where the lesions were described, the patches were small, pea to dime-sized, numerous, irregular, angular and linear in form. Such was the type of the lesions in the majority of the cases in the two epidemics occurring in an asylum for girls in this country, and reported by Bowen⁹ and Putnam.¹⁰ Horand, quoted by Bowen, declares that in epidemics among soldiers many of the spots were very small and lenticular. It might be suggested by some that these cases were possibly ringworm, but Bowen is emphatic in stating that in the cases seen in the Boston epidemic the spots were smooth, with no scaling or broken hairs, and repeated microscopical examinations were negative; besides, in six months practically all had recovered, a thing which could not occur in institutional ringworm. The two epidemics were remarkable because of the large number of girls affected, 63 out of 69 in the first epidemic and 26 out of 45 in the second epidemic. The two epidemics were traced to one girl, Ethel S., age 11, who was taken in a private family after the first epidemic. It was not known whether she had entirely recovered at the time. It was found later that several bald areas developed on the scalp of the husband of the woman with whom she lived not long after her coming to them. After three years Ethel S. was readmitted to the asylum. It was not definitely known whether hair had grown over all the spots. Four or five months after her return 26 out of 45 children became affected. These are apparently the only epidemics reported in this country. In France a number of epidemics have been reported in schools and among soldiers. French observers consider the disease practically only from its contagious aspect, and report a large number of cases in which combs, hair, and shaving brushes, towels, headrests, pillows, etc., are factors in its spread. Hallopeau and Leredde¹¹ report seeing at a fifteen-day interval two attachés of a cabinet minister, who had the disease in exactly the same place on the back of the head, and who had both used the same high-backed armchair. They have also observed several instances of the transmission of the disease between husband and wife. To Sabouraud¹² we owe a debt of gratitude for his painstaking and exhaustive investigations into the parasitic nature of the disease. He considers alopecia areata as contagious and therefore due entirely to a parasitic cause. After investigations extending over a long period of time, he has found in the upper dilated portion of the diseased follicle which he calls "L'utricule peladique," a micro-bacillus which he named "le microbacille de l'utricule peladique." This bacillus is extremely small, and is found in great numbers in the affected follicles. Although he is almost sure of its rôle in the causation of alopecia areata, it has been impossible up to the time of the publishing of his results to make successful cultures and inoculations. It was impossible to

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differentiate this bacillus from the acne-comedo and seborrheic bacillus of Hodara, by any physical or biological means. Bacteriological investigations have also been made by Robinson, Norman Walker and Marshall-Rockwell, Bazin, Crocker, Vaillard and Vincent and others. The question of treatment is a debatable one. Those who believe the cause entirely parasitic, do not care for other than local treatment, while others who believe it a neurosis depend mostly on constitutional and hygienic measures for results. Believing as I do, that the contagious variety is a new disease of as yet unknown bacteriology, which for the lack of something better has been classed under the heading of alopecia areata, I think a judicious use of both local and constitutional methods produces the best results, as we cannot as yet definitely differentiate the two varieties of the disease. Locally the use of resorcin in 2½ to 6 per cent, solutions, in combination with irritants such as cantharidis and capsicum, is of value. I vary the strength of the last two ingredients in accordance with the effects produced, the indication being to cause considerable stimulation of the scalp, as evidenced by slight redness, sensation of warmth after application of the lotion, etc. The lotion is applied twice daily and well rubbed in with a circular motion. I use the resorcin for its known specific action against the bacilli asserted to cause seborrhea and which are so frequently found in cases of alopecia areata. I also hoped that it might be destructive to the microbacillus of Sabouraud, which might be a possible etiological factor and which is so nearly allied to the seborrheic bacillus. Another local application of great value is 95 per cent. phenol. The manner of using it according to Dr. Bulkley,¹³ the originator of the method, is as follows:

A small swab is made by twisting some cotton at the end of a toothpick. This is then dipped in pure carbolic acid and vigorously rubbed over the bald area, the space treated not to exceed two square inches. It is best to carry the application slightly beyond the bald area, and into the apparently healthy hairs. In a large area the surface is treated in successive portions, at intervals of some days. A scab is formed over the painted area, which scales off in about a week to ten days. The same spot should not be again painted before two weeks have elapsed. I have never seen a slough follow its use, nor have I noticed any other untoward effect. Unfortunately the application is not painless, the amount of pain varying with individual susceptibility. I have never known a patient to refuse subsequent applications. There is no doubt of its capacity in promoting hair growth. I have been applying it for the past three months, alone and in combination with stimulating lotions, in about fifteen selected dispensary cases. Each case had two or more bald areas of varying sizes. As a control one or more spots were always left untreated. In the majority of the cases, the hair growth was

markedly increased over the treated areas. In one case, in a treated spot about 3½ inches in diameter, the hair is 1½ inches long. An almost adjoining untreated bald area of the same size has hardly an appreciable fuzz. I have had no personal experience with the high frequency current in this condition, having only one case of total alopecia areata being now under treatment by this method. It has been extolled by some and condemned as useless by others. The eyes should be examined in all cases of extensive alopecia areata. Of six patients who consented to see an ophthalmologist, and were examined through the kindness of Dr. David Webster and his assistants at the Manhattan Eye and Ear Hospital, five were found to have various errors of refraction, and in these, some weeks after the wearing of the corrective glasses, the hair over the untreated areas began to grow in a surprising manner. I know at present of a male nurse who with an existing error of refraction, neglected the wearing of his glasses. He is now suffering from eye strain and has an area of baldness about one inch in diameter over the right temple. He has lately, at my suggestion, faithfully used his glasses, with the result that the eye strain has disappeared and the patch is rapidly being filled in with a large number of white hairs, and this with absolutely no other treatment whatsoever either local or constitutional. These cases have proved to me that where errors of refraction or ocular insufficiency coexists with an alopecia areata, the correction of the ocular defect with the subsequent relief of the eye strain undoubtedly is a contributing factor in the cure of the disease. Internally, everything should be done to improve the general health. Arsenic, quinine, iron, phosphoric acid, strychnin, hypophosphites, phosphates alone or in various combinations may be used to advantage. I am particularly fond of iron and quinine citrat given in increasing doses and pushed to the point of tolerance. The bowels should be kept open, and the patient should lead as regular a life as possible, avoiding the late retiring so prevalent in our day. A certain amount of outdoor life is indispensable, and deep breathing when outdoors should be encouraged.

It must be kept in mind that there is no specific remedy for alopecia areata and that the prognosis, with the exception of total alopecia areata, is rather favorable, especially when confined to a few spots and in younger persons. Under these circumstances we should avoid the mistake of considering any measure as infallible, simply because we have seen a few cases end in recovery, supposedly on account of its use. In conclusion, I will reiterate that the best results occur from a combination of local and constitutional measures effected after a very minute inquiry into the physical and mental status of the individual.

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LATERAL CURVATURE OF THE SPINE.*

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THIS paper will attempt to define lateral curvature of the spine; to touch upon the etiology, pointing out the importance of congenital bony asymmetries; to distinguish between simple functional weak-back and structural scoliosis, and to outline treatment.

Of all deformities, there is no other that so greatly taxes the thought and skill of the physician and the especial ingenuity of the orthopedic surgeon as does that of scoliosis. Lateral curvature of the spine may be defined as a deformity of the spinal column, in which muscle weakness plays an important part, characterized by a deviation of all or part of the vertebræ laterally, and tending toward spinal rotation. Rotation usually includes the ribs and, by misshaping the chest, greatly adds to the unsightliness of the deformity and to the complexity of the treatment.

The causes are found in weakness or asymmetry of the bony system (rickets or bony numerical variation); in weakness of muscles (due to prolonged illness or simple lack of development), or in paralysis (involving the motor nerves of the trunk). Simple muscle weakness, from lack of development in the pre-adolescent years, is the most common cause. A boy or a girl—more commonly the girl—increases the size of his bony system more rapidly than his muscular and yet during that period, through habit or otherwise, puts that bony frame into postures or under extra weight-bearing strains which it is not yet able to bear, and under which it sags. If these saggings become habitual in any

direction, a "set" is made and a deformity is started in that direction.

So long as these sags are simple and correctable by will or by the simple hand-hanging test, the deformity is transient and is called functional weak-back. When the "set" has so modified structure—stretched muscles and ligaments with complemental contractions of antagonistic muscles and ligaments, and especially has wedged the vertebræ and changed the curves of the ribs—as to "fix" the deformity, it is called structural scoliosis. Today the treatment of these two conditions is radically different. The treatment of functional weak back is hygienic, gymnastic and sometimes supportive; the treatment of structural scoliosis is forcibly corrective and supportive.

Of first importance in treating functional weak back is to hunt out and remove the causes, secondary as well as primary. Sufficient sleep and wholesome food must be insisted upon. The hours at school, at home studies, the time given to "extras," such as piano and dancing lessons, evening parties, the carrying of heavy weights, must all be looked into. These children like to curl upon a sofa to read when they should be out in the outer air. Certain tendencies of clothing must be noted and corrected. Undergarments should be suspended by straps carried near the base of the neck. Goldthwaite has pointed out that when carried near the tips of the shoulders they tend to round shoulders. Clothing must not be buttoned too tightly in front. The adolescent girl whose front is developing, must have plenty of clothing room at that place. None of these things are too trivial for the physician to supervise.

But the deformity is principally due to muscle weakness and these children need systematic prescription exercises. Such a paper as this cannot do more than outline principles of exercises. Two objects should be aimed at. First, the proper training of posture in the child, which often includes retraining of the child's posture-concept, and is best attained by doing various exercises while the child faces a wall mirror; and second, muscle building. Both of these are important. The child must learn proper carriage and must attain sufficient muscle bulk to maintain it. There are a number of children, and this is particularly true of those whose weakness follows wasting disease or infantile paralysis, who for a time need the aid of artificial support. The test, in the physician's mind should be: can he accomplish enough, in the small fraction of the day given to specific exercises, to counteract the strain put upon weak muscles, during many hours when the child goes unsupported, in an upright position. He will find there are many cases

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in which unsupported strain is so great that it cannot be overcome in the short period of muscle training. These children need the support of a mild brace. With some girls a simple re-enforced corset is sufficient.

Of late years the treatment of structural scoliosis has assumed new interest, due to real strides made in the better understanding of the mechanics and pathology of the deformity and in the application of more radical methods of treatment. The latter consists in the substitution, for inefficient gymnastic treatment, of much force applied directly to the rigid bony deformity; and the maintenance, in plaster of paris jackets, of corrected positions. Much real improvement has been accomplished by this method. Michael Hoke of Atlanta added materially to the value of plaster of paris jackets when he suggested the use of chest-expanding windows over the regions of thoracic hollowness. Today orthopedic surgeons are experimenting with and trying various ways of applying the corrective force to the spine. Until last summer the principal attention has been given to pressures and tractions placed upon the trunk and thorax, while the patient is placed in an *extended* position of the spine. In the summer of 1911, Abbott of Portland, Me., appeared with the statement that greater correction can be obtained by placing the patient in a *flexed* position of the spine, before applying lateral tractions to the trunk and thorax. He places the patient in a greatly sagged hammock, in the dorsal decubitus. The author finds himself today unable to give a positive opinion on the relative value of the extended or the flexed position of the spine,† but he wishes to point out, as does Abbott himself, that this is the distinguishing point of Abbott's method, and that Abbott's use of traction bands or of windows is not original.

With all of this attention paid to the deformity of structural scoliosis, it is sincerely hoped and by the author believed that this greatest of bodily deformities will be conquered.

In conclusion, the term lateral curvature of the spine includes simple functional weak-back and structural scoliosis. Although the one tends to grade into the other, from the standpoint of treatment, the conditions are very different. Functional weak-back is due principally to muscle weakness, is a transient deformity, which can be overcome at any time by the simple hand-hanging test and is treated by carefully planned exercises, by attention to hygiene and occasionally by a temporary artificial support. The treatment of structural scoliosis must first aim to over-

come the rigid deformity. This cannot be done by exercises. Forcible correction and retention of improved positions in specially made plaster of paris jackets offers much encouragement.

CARDIAC SEQUELAE OF TONSILLAR INFECTION.*

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THE variety of diseases which are supposed to have had their origin in tonsillar infection is indeed legion, yet the literature covering the cardiac sequelæ is scanty, and reports of cases very difficult to find. The writer's experience has been as follows: Of 725 cases seen in general practice there have been 25 instances of tonsillitis, or 3.4 per cent. Of these 25 cases 4, or 16 per cent., developed definite cardiac complications. In several of the others slighter heart disturbances were present. Haig-Brown¹ reports 345 cases of tonsillitis in 33 of which, or 9.6 per cent., a cardiac murmur developed, 8 cases had endocardial lesions which terminated in chronic disease, 3 had pericarditis, 10 had the physical signs of mitral regurgitation which disappeared, and 8 had functional murmurs due to anemia.

CASE I.—Milton M., aged 4. At 18 months had pneumonia. In June, 1910, I attended him during an attack of measles, at which time the heart was found to be normal. On February 15, 1911, I was called to see him because of a sore throat. The afternoon before he had appeared feverish and slightly ill, and his mother found his temperature 102. Examination showed very little prostration. The submaxillary lymphatic glands on both sides were somewhat enlarged, but not tender. The throat was slightly reddened, and both tonsils, which were moderately hypertrophied, presented several points of exudate. The heart sounds were clear, pulse 136. On the following day the culture which I had taken was declared negative. The tonsils showed more spots of exudate although there was less complaint of soreness. A faint mitral systolic murmur was present for the first time. The pulmonary second sound was split and accentuated, and the aortic second was accentuated, pulse 128. On the third day the apex beat was rather diffuse in the fifth interspace, nipple line; the cardiac boundaries were normal. The first mitral sound was weak and was followed by a soft systolic murmur; pulmonic first inaudible, pulmonic second split and accentuated, pulse 132, temperature 101.4. On the fourth and fifth days the pulse was small and soft, and considerable irregularity was at times present. The urine was negative. On February 25, the tenth day, the

† Further experience with Abbott's method now places the author in a position of unqualified endorsement of the principle of the flexed position, although improvement in minor details of technique may be made.

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murmur had disappeared, pulmonic second accentuated, heart action much stronger. Three months later I examined him and found the heart sounds clear, pulmonic second accentuated.

In this case the cardiac disturbance was of a mild character and cleared up fairly rapidly. Probably the myocardium was principally affected.

CASE II.—Annabel L., aged 7, maternal grandmother mildly insane, mother extremely neurotic. At six months had a severe attack of intestinal trouble. With the exception of measles and frequent colds has always been well. No previous throat affection. For three days prior to September 16, 1910, she had a slight sore throat and felt indisposed; on that day was feverish. Examination showed a well-developed and well-nourished girl with flushed cheeks, hot skin and rapid pulse. The tonsils were moderately hypertrophied and a little red. One submaxillary lymphatic gland on each side was considerably enlarged and slightly tender.

September 17. Temperature 99.1, pulse 92. The throat was only slightly congested, no exudate. Faint systolic murmur in mitral area; pulmonic second accentuated and reduplicated.

September 19. She feels very well and wants to get up. Throat clear and glands subsiding, yet temperature had risen to 102.1, pulse 96. Heart outlines practically normal. The soft mitral systolic had become a little plainer; pulmonic second greatly accentuated and reduplicated. The pulse rate varied considerably from moment to moment.

September 21. Some pain over precordium. Pulse 96, slightly irregular with an occasional intermission.

The patient was kept in bed until the end of January, 1911. During this period a slight rise of temperature appeared practically every day, usually going a little above 99 per oram in the afternoon, occasionally to 100 or 101. The rapid pulse persisted, averaging between 90 and 120. The mitral systolic murmur, which followed a weakened first sound, varied from day to day. At times it was plainly heard over most of the precordium and again was almost inaudible. It was never transmitted to the axilla or back. The second pulmonic was greatly accentuated and usually reduplicated, the second aortic was somewhat accentuated. The first sounds at the base were nearly absent but became stronger as the case improved. The child made no complaint whatever and appeared perfectly well in spite of the cardiac signs, the rapid pulse, and slight but persistent elevation of temperature for which no other cause could be found. The urine was practically negative throughout. After the patient was gradually allowed up following a 4-months' rest in bed, the temperature continued to show an occasional slight rise for an indefinite period. About two months later, April 14, she was taken with a

sharp attack of tonsillitis with thin films of exudate on both tonsils, cervical glands enlarged and tender, temperature 103.5, pulse 136, cheeks flushed, and eyes glassy. Culture was negative. After the attack was over the cardiac condition remained unchanged. October 24, 1911, the tonsils and adenoids were removed. I examined her lately, April 6, 1912, and found her in good physical condition without any cardiac symptoms. The mitral murmur had disappeared. All of the heart sounds were clear and of good strength, the second sounds at the base were somewhat accentuated.

Here we have the picture of a slight throat inflammation, hardly severe enough to be dignified by the term tonsillitis, followed by signs of cardiac mischief and fever lasting many months. On the contrary, the second attack of tonsillitis, which was accompanied by severe symptoms and high temperature, seemed to have no deleterious effect upon the heart or other organs. It appeared as if the fury of the infection had spent itself upon the tonsils, exciting a severe inflammatory reaction which was sufficient to prevent the organisms from penetrating further. Adler² has presented this idea very clearly.

CASE III.—Myron L., aged 6, brother of preceding patient. At 2 years of age had measles followed by pneumonia and empyema for which he was operated upon. Made a perfect recovery. Has had diphtheria. The patient had hypertrophied tonsils and adenoids, and largely because of his sister's disagreeable experience following tonsillitis, the tonsils and adenoids were removed by a thoroughly competent operator, November 2, 1910. I was asked to see him April 7, 1911, because of headache and a slight sore throat which had been present since the day before. The throat was a little reddened, no exudate visible, considerable muco-pus on posterior pharyngeal wall, stumps of tonsils present. Several good-sized cervical glands, firm and slightly tender, were present in both anterior triangles. Faint mitral systolic murmur, pulmonic second accentuated. Pulse 100, sharp impulse, occasional intermission noted.

April 8. Tonsils less red, no exudate. Well defined systolic murmur, heard best midway between mitral and tricuspid areas, transmitted over entire precordium but not into axilla. Pulmonic second accentuated and split. Heart outlines normal. Temperature 101.5.

April 11. Throat negative; cervical glands smaller and not tender.

From this time on the patient usually had a slight daily elevation of temperature to 99+. The pulse on the other hand was slow, often 60 to 65, and averaging from 75 to 80. The systolic murmur became louder and was transmitted all over the precordium, to the axilla and angle of the left scapula, and upward into the great vessels of the neck. Pulmonic second accentuated and split. The boy felt perfectly well and

played so vigorously while in bed that after a difficult time for 3 months we were obliged to let him up. The slight fever still persisted, but no other signs save those found in the heart were present. Toward the end of his rest in bed the systolic murmur became fainter and was no longer transmitted into the axilla. The urine remained constantly negative. I examined him again April 6, 1912, and found a lively, husky lad presenting no symptoms. The heart outlines were normal, the first mitral sound was impure, otherwise the heart sounds were clear and of good strength.

The similarity of these two cases, occurring in brother and sister, is striking although they were separated by an interval of several months. Both had slight but long continued fever. The girl's pulse was persistently rapid, the boy's distinctly slow. Both have made practically perfect recoveries and in each the trouble started as an exceedingly mild sore throat. The removal of the boy's tonsils, 5 months before, done for the very purpose of preventing systemic infection, failed absolutely. Whether the infection entered through bits of tonsillar tissues remaining, or through the mucous membrane of the fauces, it is impossible to say.

CASE IV.—Janet S., aged 7, seen January 1, 1912. Has had no infectious disease save measles, no previous throat disturbance. Awoke on that morning with a sore throat, vomited once and has been feverish. Some headache. Examination showed a slender child with drooping shoulders and flat chest. The throat was very red, especially on the left, and two good-sized patches of dirty white exudate were present on the left tonsil. The left submaxillary glands were tender. No rash. Took a culture which was reported negative.

January 3. Patient out of bed against orders. Throat less red and swollen, several white spots of exudate on both tonsils. Heart: apex beat in fifth space, three-fourths of an inch outside the nipple line; left border, one inch outside nipple line; right border, one-half inch to the right of sternum; upper border, second rib. Systolic murmur present, heard best over center of precordium and at base of heart, not transmitted into axilla; pulmonic second accentuated.

This case ran a course similar to the brother and sister just reported. The systolic murmur persisted, and later a rougher systolic bruit followed by a snappy second sound could be heard over the great vessels of the neck. The temperature and pulse were taken only when I made my visits. The pulse averaged from 80 to 85, was soft, small and often irregular. The rectal temperature I never found normal. It ranged from 99.2 to 100.4. The urine was negative. The patient stayed in bed part of the time for two months and then insisted upon getting up. For three years she had suffered from alternating attacks of diarrhoea and constipation, worse

since the present illness began. Examination of the stools revealed numerous ova which I was unable to identify, but no parasites. On April 3, 1912, I examined her again. She presented no symptoms and had attended school that day for the first time. Immediately following the first sound of the heart was a systolic murmur having a somewhat rough character. It was heard all over the precordium, best in the center, was not transmitted to the axilla, but upward into the great vessels. Pulmonic second greatly accentuated. The heart still appeared to be somewhat enlarged. Rectal temperature 99.3.

In 1887, Haig-Brown¹ made the statement that in connection with so common a disease as tonsillitis we undoubtedly have the explanation of certain of the cardiac cases for which no cause can be found. In 1889, Hingston Fox² stated that even in simple tonsillitis it is common to find some signs of heart disturbance. A number of writers have shared these views. Osler⁴, in his splendid article on acute endocarditis, from which I freely quote, says that the tonsils are probably the portals of entry for the microorganisms of the not infrequent cases in which we meet with endocarditis without recognizable cause. "The tonsils, the mycotic hotbeds, are responsible for a great many cases, and if, as is now commonly believed, the infection of acute rheumatic fever is here nurtured, they take the first rank as sources of infection. Certainly from them may be cultivated at any time the very organisms most prone to excite endocarditis." He aptly characterizes the crypts of the tonsil as natural culture tubes. In a study of the tonsils removed at operation from 45 patients suffering from various conditions, Davis⁵ found that the predominating organisms from the surface belonged to the pneumococcus group, whereas those obtained from the depths of the crypts showed a pure growth or nearly pure growth of streptococcus.

Osler⁴ states that a majority of cases of endocarditis present no symptoms. "In children endocarditis is the most serious single affection, responsible for almost as many deaths as all of the exanthematous affections of childhood together" and in them fever is the most important sign. In tonsillitis the recurrence of fever after the temperature has fallen is the best indication that valvulitis is present. He states that there is nothing characteristic in the fever, a daily rise of 1 to 3 degrees being present. There may be no other signs save prolonged slight fever to show that anything is wrong. In the milder cases the vegetation may disappear completely and leave no damage.

The paper of Packard⁶, 1899, reporting five cases of endocarditis following tonsillitis, has been frequently quoted. It is interesting to note that in four of his cases the throat inflammation was of a mild character with no exudate present. Adler² has well described these exceedingly mild

forms of throat inflammation, so slight as to be frequently overlooked by both patient and doctor, which may nevertheless lead to severe systemic infection. Osler⁴ says that "there may be nothing more than a diffuse reddening, with edema and relaxation of the fauces. Many of the obscure febrile attacks in children, lasting from five to seven days without any localizing features, are associated with a tonsillitis of a very mild character. In such an attack endocarditis may lay the foundation of subsequent valve lesions."

Today we probably should not call all of Packard's cases examples of pure endocarditis. We have learned that inflammations are not apt to respect anatomical boundaries. In acute meningitis the underlying brain substance is affected coincidentally with the meninges. In acute poliomyelitis the changes are not limited to the anterior horns of the cord, as was formerly taught, but involve the adjacent meninges and may extend quite widely throughout the cord substance. So in acute heart affections, as Sturges⁷ and Meara⁸ have emphasized, the endocardium, myocardium and pericardium are usually affected together, although any one of them may bear the brunt of the attack. In a careful pathological study of 287 cases of endocarditis, Brooks⁹ found myocardial disease present in practically all cases, acute and chronic. He concludes that the character of the myocardial changes determines to a large degree the future of any case of endocarditis. These changes are not produced by the endocarditis but both usually depend upon the same cause.

What is the etiology of the four cases reported in this paper? In view of the great frequency with which the infection of rheumatic fever enters through the tonsils, can they be regarded as types of rheumatism without joint involvement? The mildness of the cardiac infection and the character of its course are points of resemblance. Still¹⁰ regards rheumatic fever as a general disease, probably of infectious origin, and believes that a child may suffer severely from rheumatism who has never had a pain in a joint. Packard⁶ believed that his cases had nothing to do with rheumatism, but called them plain cases of tonsillitis and pharyngitis in which the heart changes were produced by the presence of the organisms themselves which gained entrance through the throat, or by toxins elaborated by them at a distance. To the writer this seems the most reasonable view, save that it is exceedingly doubtful if true endocarditis or pericarditis can be produced by toxins alone. These very frequently produce myocardial changes, but the careful experiments of Fulci¹¹ seem to show that the injection of the most varied bacterial and other poisons, even when the heart valves were previously injured, is incapable of producing endocardial changes. These four cases, then, probably fall in the class mis-

named benign or simple endocarditis. Osler⁴ maintains that the so-called benign endocarditis kills in the long run a very much larger number of persons than the malignant form. Endocarditis is always a serious lesion, if not immediately by loss of substance, remotely by the sclerotic changes which it initiates, which lead in most cases to retraction and insufficiency.

The renal complications of tonsillitis do not come within the scope of this paper, but cases of hemorrhagic nephritis following tonsillitis have been reported often enough to put us on our guard. Adler² believes that in about 75 per cent. of all cases of tonsillitis a desquamating nephritis occurs. In the vast majority of cases this disappears spontaneously but in a few instances it develops insidiously into the chronic form.

The treatment of the cardiac sequelæ of tonsillar infection is really a function of preventive medicine. We cannot overcome the damage that has already been wrought, but by careful management may do much to avert disastrous after results. The sheet anchor in treatment is prolonged rest in bed which should continue, according to Osler⁴, at least three months from the onset of fever. Unfortunately the patients often feel so well that they become very difficult to control.

We have here another argument in favor of the complete removal of tonsils which are hypertrophied or subject to recurring attacks of inflammation. Their presence under these conditions is a constant source of danger. If operation is undertaken the work should be thoroughly done. In attacking a diseased appendix the surgeon does not attempt to leave the stump of this organ but removes it *in toto*. Our treatment of diseased tonsils should be based upon similar principles.

Conclusions.—1. Every case of tonsillitis or throat inflammation should be regarded as a serious disease, and should be treated by rest in bed.

2. Before discharge every case should have several careful examinations of the heart and urine.

3. Cardiac complications following throat infections are much more common than is generally believed.

4. When cardiac sequelæ occur they should be treated by prolonged rest in bed.

REFERENCES.

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Occurring in the Course of Tonsillitis. *Am. J. Med. Sci.*, Jan., 1900, p. 1.

7. Quoted by Osler, 4.

8. Meara: Treatment of Acute Endocarditis and Myocarditis. *J. Am. Med. Ass.*, Feb. 3, 1912, p. 317.

9. Brooks: A Study of the Myocardial Changes in 287 Cases of Endocarditis. *Am. J. Med. Sci.*, Dec., 1911, p. 781.

10. Still: Rheumatism in Childhood. *Practitioner*, 1901, p. 53.

11. Fulci: Experimental Endocarditis. Ziegler's *Beitrage zur Patholog. Anatom.*, xlv, h. 2, 1909, Med. Akad. Rome, April, 1910.

Quoted by Beifeld: The Relation of the Tonsils to Heart Disease. *Interstate Med. J.*, Vol. XVIII, No. 6.

Correspondence.

THE DOCTOR'S BILL.

To Editor of *New York State Journal of Medicine*:

To every physician who has the nobility of his profession at heart, the sending of a bill for his services to a patient is always somewhat of a regret. Even in those instances when he knows that the cheque for the same will come by return mail, he has his qualms.

The bill when made out usually has not asked pecuniarily even a small portion of what is really his due; on the other hand, if he had sent such a bill as he should, even grateful, generous patients would question it in their minds, while sending a cheque without comment, all the same.

This proceeds with such people from the fact that they have learned to love and admire their physician over and beyond the ordinary man. He still represents something ideal to them,—like their minister, or perhaps in some ways, above and beyond him, so long as they are a little bit "of the earth, earthy." With others,—today, a numerous class—the payment of the doctor's bill is often delayed, or if paid very soon, is thought *enough*, and gratitude is compensated and cancelled. It's business to such people,—and, alas, they have become more numerous by reason of specialists and specialism. In these may be represented what is termed progress, but if so, idealism, as a rule, goes by the board. How remedy a great wrong in a way to the medical practitioner who still looks after the family's nearest and dearest interests?

I know *not* except in one way: by giving in love, trust, loyalty, what is rarely given in money. There is not, there never has been, a profession equal to ours, when practiced, as it should ever be, with a soul above lucre. If the honorarium comes, or is sent, as it should be, let it be accepted with thanks and appreciation, as much for the qualities it represents as for the money itself. If it doesn't come, let's say and believe truly: we entered our profession, as the professed followers of Christ should, *not* for "the loaves and fishes," but to serve God and man in the best, highest way. We will pray with him (man)

when required, as sincerely and devoutly as mortal can, but we will also do for him in such wise, so far as body and mind are concerned, that he will learn to respect and love us, as the type of thoroughly square, honest doing, of self-sacrifice beyond compare,—and the expression, so far as may be, of what Christ told men to do to show absolute loyalty to Him and to His service.

BEVERLEY ROBINSON, M.D.

New York, July, 1912.

It is one thing to be willing to give to the poor, quite another to surrender or reduce a just and proper fee to those who do not need charity nor deserve it. Neither does it seem to the editor to be laying sacrilegious hands on the ark of the covenant when an honest attempt is made to put the medical profession on a sound business basis.

Many of the evils which have been denounced by the press have come upon us because of the poverty of the rank and file. We ourselves are to blame, and if we wish to cure the evils complained of it will not be by expressions of regret when our bills are paid. It was a great prophet and teacher who said: "The laborer is worthy of his hire."
EDITOR.

The Medical Society of the State of New York

DISTRICT BRANCHES.

Annual Meetings and Officers for 1912.

FIRST DISTRICT BRANCH.

Annual Meeting, Friday, October 4, at Poughkeepsie, N. Y.

President—D. B. Hardenbergh, 7 Orchard St., Middletown.

Secretary—C. E. Denison, 143 W. 76th St., New York.

SECOND DISTRICT BRANCH.

Annual Meeting.

President—W. B. Chase, 1050 Park Place, Brooklyn.

Secretary and Treasurer—C. Eastmond, 67 Hanson Place, Brooklyn.

THIRD DISTRICT BRANCH.

Annual Meeting, Tuesday, October 1, at Troy, N. Y.

President—J. B. Harvie, 6 Clinton Place, Troy.

Secretary—W. Kirk, Jr., 2167 5th Ave., Troy.

FOURTH DISTRICT BRANCH.

Annual Meeting Tuesday, October 8, at Glens Falls, N. Y.

President—F. G. Fielding, 72 Ridge St., Glens Falls.

Secretary—F. J. Resseguie, 509 Broadway, Saratoga Springs.

FIFTH DISTRICT BRANCH.

Annual Meeting, Thursday, October 3, at Oswego, N. Y.

President—J. K. Stockwell, 43 E. Bridge St., Oswego.

Secretary—F. H. Flaherty, 320 Montgomery St., Syracuse.

SIXTH DISTRICT BRANCH.

Annual Meeting, Tuesday, October 15, at Binghamton, N. Y.

President—F. M. Miller, 143 Court St., Binghamton.

Secretary and Treasurer—L. Coville, 514 E. Buffalo St., Ithaca.

SEVENTH DISTRICT BRANCH.

Annual Meeting, Thursday, October 10, at Corning, N. Y.

President—H. B. Smith, 143 Pine St., Corning.
Secretary—J. F. Myers, Sodus.

EIGHTH DISTRICT BRANCH.

Annual Meeting, Tuesday and Wednesday, September 24-25, at Buffalo, N. Y.

President—H. A. Eastman, 208 Lafayette St., Jamestown.

Secretary—C. Tompkins, 150 Allen St., Buffalo.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF
DUTCHESS.

REGULAR MEETING, JULY 10, 1912.

The President, Dr. J. C. Otis, in the chair, Dr. Otis having come all the way down from Lake George to preside. There were fifty members present, including most of the physicians of Poughkeepsie. The following officers were nominated for election at the October meeting: For President, M. M. Town, of Rhinebeck; Vice-President, Grace N. Kimball, Poughkeepsie; Secretary, F. J. Mann, Poughkeepsie; Associate Secretary, George Hemingway, Poughkeepsie; Treasurer, Louis C. Wood, Poughkeepsie; Censors, J. W. Poucher, Poughkeepsie, J. H. Cotter, Poughkeepsie, and D. H. MacKenzie, Millbrook; Delegate to State Society, J. C. Otis, Poughkeepsie; Alternate to State Society, A. L. Peckham, Poughkeepsie.

A new office was made, that of Associate Secretary, to be filled by Dr. Hemingway.

Dr. Herbert D. Pease, formerly of the State Department of Health, now of the Lederle Laboratory, New York, gave an interesting talk on "Sanitation in the Rural Districts," which was discussed at considerable length. Dr. Pease touched on water supply, sewage disposal, flies, etc. Dr. T. K. Cruse, of Wappingers Falls, discussed mental defectives, giving the case of a child that had come under his care as an illustration. After the meeting a most enjoyable dinner was held at the Millbrook Inn.

MEDICAL SOCIETY OF THE COUNTY OF
GENESEE.

REGULAR MEETING, AT OAKFIELD, JULY 10, 1912.

A letter from the State Secretary pertaining to a resolution passed at the State meeting in April, in regard to commissions given or received for recommending patients, was read.

A resolution providing for the establishment of a County Laboratory at Batavia was passed.

SCIENTIFIC SESSION.

"Internal Secretions," A. E. Woehner, M.D., Buffalo.

"Ophthalmic Cases Seen in General Practice," R. C. Conklin, M.D., Batavia.

MEDICAL SOCIETY OF THE COUNTY OF
ALLEGANY.

REGULAR MEETING, AT WELLSVILLE, JUNE 20, 1912,
SCIENTIFIC SESSION.

Talk on A. M. A. Meeting at Atlantic City, B. A. Barney, M.D., and Leon Keyser, M.D., Hornell.

Talk on Affairs of the Eighth District Branch, H. A. Eastman, M.D., Jamestown.

The Society was entertained by the President, Dr. F. E. Comstock, and over twenty members with their wives sat down to dinner at the Country Club. After dinner music, readings and dancing was provided for the entertainment of all.

MEDICAL SOCIETY OF THE COUNTY OF
FRANKLIN.

ADJOURNED SEMI-ANNUAL MEETING, AT SARANAC LAKE,
JUNE 25, 1912.

SCIENTIFIC SESSION.

"Bronchitis in Children," F. F. Finney, M.D., Burke.

"Senile Cataract," J. A. Grant, M.D., Malone.

"Secondary Infection in Pulmonary Tuberculosis," L. Brown, M.D., and S. A. Petroff, M.D., Saranac Lake.

Discussion by H. M. Kinghorn, Saranac Lake.

"General Paresis," H. W. Blodgett, M.D., Lake Placid.

"Spontaneous and Artificial Pneumothorax in Tuberculosis," J. W. Price, M.D., Saranac Lake.

Dr. Price exhibited the apparatus and explained in detail the technic in producing artificial pneumothorax.

Discussion by L. Brown, M.D., and S. W. Outwater, M.D., Saranac Lake.

"Drug Dosage in Children," Wm. N. MacArtney, M.D., Fort Covington.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

A TEXT-BOOK OF GYNECOLOGY. By William Sisson Gardner, M.D., Professor of Gynecology, College of Physicians and Surgeons, Baltimore, Md. With 138 illustrations in text. New York and London, D. Appleton & Company. 1912.

THE CARE OF THE SKIN AND HAIR. By William Allen Pusey, A.M., M.D., Professor of Dermatology in the University of Illinois. New York and London, D. Appleton & Company. 1912.

KIDNEY DISEASES. By W. P. Herringham, M.D., F.R.C.P., Physician to St. Bartholomew's Hospital, etc. With chapters on Renal Diseases in Pregnancy by Herbert Williamson, M.D., F.R.C.P., Assistant-Physician-Accoucheur to St. Bartholomew's Hospital, etc. London, Henry Frowde, Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912. Price, \$5.50.

DEATHS.

ALFRED W. HENCKELL, M.D., Rochester, died June 30, 1912.

EARL A. SCOFIELD, M.D., Bemus Point, died June 24, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

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SEPTEMBER, 1912

No. 9

EDITORIAL DEPARTMENT

AGAIN THE BATTLE OF THE EXPERTS.

SOME years ago a young man of wealth whose pranks had for some time been the wonder of the underworld, committed homicide. His victim was a well known man about town. After a long struggle lasting through two trials he was finally acquitted on the ground of insanity. At both trials, numerous experts for the State all testified with great vigor and immense conviction to their belief in his sanity, and an equal number of medical experts for the prisoner testified with equal enthusiasm as to his insanity. As a result of the second trial he was sent to Matteawan. Several pathetic attempts have been made by his unfortunate and devoted mother to secure his release. At the hearing which dragged its slow length through June and July much bitterness was shown by the attorneys on both sides so that it became a battle royal between the opposing advocates rather than a calm judicial investigation into the facts. The number of medical experts on both sides was mercifully limited to three by the presiding justice, but the medical profession and the public have again been treated to the humiliating spectacle with which we are all too familiar. Three eminent alienists have testified that the prisoner is a paranoiac and three others that he is perfectly sane. It is quite impossible to believe that any of the six experts has testified to what he believes in his heart to be false. The high standing

and well known integrity of the witnesses forbids any other conclusions. The trial simply emphasizes the fact that men's opinions are influenced by the point of view. It always has been so. It always will be so. This fact well known to our jurists is the only excuse for the prolonged examination to which our jurors are subjected to insure the exclusion from the box of any man having bias.

But in the matter of the medical experts our jurists travel in exactly the opposite direction and do their best to secure witnesses who are to testify not to facts but as to their opinion on facts. Naturally the results have been disappointing to the public and the courts, humiliating in the extreme to the medical profession.

For a number of years in many of the states earnest and vigorous efforts have been made to improve matters by legislative enactment. After years of disappointment within the last five years several states have passed laws which were satisfactory to both professions only to see them overthrown in the court of last resort as unconstitutional. In view of this fact it may be interesting to briefly state the fate of the various measures which have been proposed:

The statute of Michigan, No. 175, An Act to regulate the employment of expert witnesses, provided that no expert witness should be paid or receive as compensation a sum in excess of the ordinary witness fee as provided by law unless the court before such witness has appeared awards a larger sum. If any

person pays such a witness a larger sum than the court awards he shall be guilty of a misdemeanor punishable by a fine not to exceed \$1,000, or imprisonment in the county jail not to exceed one year, or both, and may be further punished for contempt. Not more than three experts are allowed to testify on either side as to the same issue except in criminal prosecutions for homicide. The court, however, in its discretion may permit an additional number of witnesses. In homicide cases, where the issues involve expert knowledge or opinion, the court shall appoint one or more suitable disinterested persons, not exceeding three, to investigate such issues and testify at the trial, and the compensation of such persons shall be fixed by the court and paid by the county where indictment was found. This provision shall not preclude either prosecution or defense from using other expert witnesses at the trial.

The statute of Rhode Island: Any justice of the superior court may, in any cause, civil or criminal, on motion of any party therein, before the trial thereof, appoint one or more disinterested skilled persons to serve as expert witnesses. The fees of the experts are fixed by the justice, but are paid by the party moving for such appointment to the clerk of the court, the amounts so paid to form part of the cost. In criminal cases, in the discretion of the court, on request of the defendant, expert witnesses may be furnished for the defendant at the expense of the state on terms and conditions prescribed by the court.

Recently the supreme court of Michigan has declared its law to be unconstitutional, and nothing illustrates the extreme difficulty of securing any reform from bench, bar or legislature better than the fate of the Michigan law, which gave general satisfaction to the members of both professions concerned. A letter received by Dr. Gay of Boston from Dr. Sawyer of Hillsdale, Mich., says: "When our law was enacted it was all we felt it was possible for us to get and still be held constitutional by our supreme court. The judgment was based on the unequal value given by the juries to the testimony of the experts called by the court." Dr. Sawyer writes that there is much regret that the law has been declared unconstitutional.

The action of the courts in Michigan leaves but one state with any special statute concerning medical expert testimony, Rhode Island. With regard to the Rhode Island law, a letter from Dr. Robert F. Noyes to Dr. Gay states that "The majority of the medico-legal cases in Rhode Island are tried without the intervention of the law" (which is permissive, not mandatory). He further adds: "I do not think the law is a decided benefit to the cause of justice. Occasionally it is, no doubt, of considerable value. The best physicians and lawyers regard the law as an accession of some value. This law does not preclude either party from introducing as much medical testimony in addition as it may see fit, the result being that there is a superabundance of medical testimony and of a conflicting nature. The fact that the judge has appointed the medical experts has some weight with the jury."

One state law has thus been declared unconstitutional and the other is not of much use since most actions are conducted without invoking its aid.

Dr. Noyes' statement that the jury may pay more attention to the experts appointed by the judge than those summoned by the parties to the action, would bring this law squarely up against the decision of the supreme court of Michigan, which, for this very reason, declared the law of that state to be unconstitutional.

The following are laws which have been proposed in the states of Maine, Massachusetts, and New York, but have so far failed to pass:

The law of the state of Maine proposed was as follows:

Section 1. When in any case in the Supreme Judicial Court or any superior court it appears that a question or questions have arisen or may arise giving occasion for the testimony of experts, the court or any justice thereof, after notice to the parties and a hearing, may appoint one or more disinterested and suitable experts to investigate the questions and prepare themselves to testify in relation thereto if called upon.

Section 2. They may be called as witnesses by either party or by the court and are subject to the same treatment as other witnesses. For their services and for their attendances as

witnesses they shall be paid from the treasury of the court such reasonable sums as the court may allow.

Section 3 states that the parties have their original rights to call other expert witnesses.

The Massachusetts act is as follows:

An Act relative to the charging of juries. Section eighty of chapter one hundred and seventy-three of the Revised Law is hereby amended by inserting at the end thereof the following words: provided, however, that with respect to opinion evidence courts shall have the same power in charging juries that they had according to the common law,—so that the said section as amended shall read as follows: Section 80. The courts shall not charge juries with respect to matters of fact, but they may state the testimony and the law: provided, however, that with respect to opinion evidence courts shall have the same power in charging juries that they had according to the common law.

The New York law, which passed the Assembly but failed in the Senate was as follows:

An Act to regulate the Introduction of Medical Expert Testimony.

Section 1. Within ninety days after this act shall take effect the Justices of the Supreme Court assigned to the Appellate Divisions thereof in the several departments, shall designate at least ten and not more than sixty physicians in each judicial district who may be called as medical expert witnesses by the trial court or by any party to a civil or criminal action in any of the courts of this state, and who when so called shall testify and be subject to full examination and cross-examination as other witnesses are. Any designation may at any time be revoked without notice or cause shown, and any vacancy may at any time be filled by the justices sitting in the appellate divisions.

Section 2. When so directed by the trial court witnesses so called shall receive for their services and attendance such sums as the presiding judge may allow, to be at once paid by the treasurer or other fiscal officer of the county in which the trial is had.

Section 3. This Act shall not be construed as limiting the right of the parties to call other expert witnesses as heretofore.

The Massachusetts law, which failed to pass, was intended to give the judge the right to comment on the expert testimony, something which he was forbidden to do before, since in charging the jury he could only state the testimony and the law. We are obliged to doubt whether if this law had passed in Massachusetts matters would have been improved for the reason that in New York State there has never been any statute restricting the power of the judge in his charge to the jury except the fear of a reversal on the part of the appellate courts. Judges in New York, therefore, have always enjoyed the rights and powers which this Massachusetts statute seeks to confer upon the courts of that commonwealth, but nowhere have there been greater scandals in respect to medical expert testimony than have been witnessed in New York City. Have we, then, any right to expect that the extension of the privilege already enjoyed by judges in New York State would, when extended to other state jurisdictions, be the means of bringing about any material reforms?

The New York law is evidently open to the same objection as that which proved fatal to the Michigan law in that it creates a number of experts who, because of their appointment by the Appellate Division Supreme Court would, for that reason, possess an authority which would be superior to that of the experts who might be called in addition, by the parties to the action. In fact, the most serious obstacle to any degree of reform at the hands of the legislature is the fact that no law can be passed which would forbid either party to the action the right to call such witnesses as he chose. This right is part of our Anglo-Saxon system of jurisprudence, and cannot be abrogated.

Any law, therefore, which seeks to put the appointment of some experts in the hands of the court, inasmuch as this right to call other experts could not be denied the litigants would have the reasoning of the Supreme Court of Michigan to contend against, because there would be two classes of experts before the court, those appointed by the court and those summoned by the litigants. It is quite true that the decisions of one state are not binding on those of any other. They

must have influence, however, and not infrequently, the decisions of one jurisdiction are quoted with approval by another. We cannot say, of course, that the New York Court of Appeals would agree with the Supreme Court of Michigan, for even judges differ, but we cannot doubt that the decision of the Michigan court would be read with interest at Albany. It is also true that it is common experience, that general objection on the part of lawyers is made to a course which creates favored experts, favored because appointed by the court. In the deliberations of the Joint Committee of the State of New York, it was in fact hoped that if the law passed the experts nominated to the Appellate Division as stipulated by the law, would for that very reason enjoy greater credit with the jury than the experts called by the litigants. In view of the Michigan decision there are serious, perhaps fatal, objections to any such course. It would, no doubt, be a very great advantage if the experts called by both sides could meet in consultation and come to some agreement. But what security would we have that they would agree better in the consultation room than in the witness box? A man who expected a large fee as a result of a successful suit would, perhaps be as little amenable in the consultation room as in the witness box. Yet if such a plan could be carried out much good might come of it. Nevertheless a recent instance in New York is not encouraging. In a recent case tried in New York there were eleven expert witnesses, some called by the defendant, some named by the District Attorney and three nominated by the presiding justice. *They all agreed that the prisoner was insane.* Nevertheless the jury promptly found him sane, whereupon the judge complimented them on their common sense, saying that he "took off his hat" to them. Unfortunately, by so doing he seemingly discredited his own witnesses and those called by the District Attorney. If one were to put his finger on the source of the whole evil he would touch the dollar mark. The enormous fees which have been paid medical expert witnesses, fees which in civil cases almost invariably are dependent upon the amount of damages awarded, are largely to blame for the evils which have come upon the medical profes-

sion. In criminal cases a man is not summoned by the defendant until his counsel has learned that his opinion is favorable to his client. The District Attorney is not going to put a doctor on the stand unless his opinion is going to build up his case. Nothing illustrates this fact better than the treatment which the court gave its own medical experts in the case just mentioned when their opinion was distasteful to the prosecution.

In reviewing the different laws it will be observed that with the exception of the Massachusetts law they all seek to strike at what is undoubtedly the source of the evil, the pecuniary side of the question, by providing that the fees of the expert shall be regulated by the court.

With respect to contingent fees, at the present time many medical experts of the worse sort accept a case on this basis. Their remuneration depends entirely on the winning of the case, and the amount to be received, on the amount of the verdict. No practice could be more conducive to bias, less likely to bring about the administration of justice. This practice has come over to the medical profession from the bar. The legal profession has recently taken some steps to limit the practice on the part of lawyers, for it has recognized that while a contingent fee is sometimes necessary in the case of a poor client, it is a practice which has been greatly abused. It certainly has no place in the case of the medical expert witness. His opinion ought to be independent of pecuniary considerations and should be placed beyond the reach of contamination.

The whole question seems to be one of great difficulty. The Joint Committee of the Medical Society of the State of New York and the State Bar Association has so far been unable to accomplish anything. One thing is certain. Whatever remedy may be suggested ought to be capable of universal application. It ought to be good law in Massachusetts, in New York, in Michigan, in California. Nor can doctors draw such a law except with the aid of lawyers. It seems a pity that so far nothing has been accomplished in this matter by the American Medical Association. Much might be done by a joint committee of the American Medical Association and the American Bar Association. We trust that such a committee may be appointed in the future and that legislation may be devised which will pass through the sieve of the higher courts and put an end to a condition which has become well nigh intolerable.

Original Articles

SURGERY OF THE BATTLEFIELD.*

By Brig. Gen. GEORGE H. TORNEY,
Surgeon General, U. S. Army.

WITHIN a period of 50 years there has been a radical change in the organization of armies, but these changes have not so completely revolutionized military methods that the procedures which demonstrated their practical value in earlier days can be disregarded.

This remark is made for the reason that in discussions of this question the impression has been forced upon my mind that it is the general view that the change in modern weapons has radically changed the work of the surgeon on the battlefield. To a certain extent this is true, but not to the great extent indicated by opinions expressed by those who are not familiar with the conditions of modern warfare.

It is not possible to cover the ground of this subject in the time at my disposal, but I will state that the system of evacuating the wounded forms the basis of the medical service on the battlefield.

The service of the evacuation of the wounded is divided into three zones:

- (a) Collecting.
- (b) Evacuating.
- (c) Distributing.

I will confine my remarks to the collecting zone, which corresponds to the zone of active operations.

In war military men recognize that sentimental, and to a certain extent even humanitarian considerations, must give way to the utilitarian view of the requirement of success in battle, and therefore, the work of the military surgeon behind the firing line of the battlefield takes on more or less an emergency character, and must depend to a great extent upon the plans of the commanding general, that is, whether the battle be one of defence, or offence; as he must be prepared to advance or retreat, with the army.

You will realize that under modern conditions, brought about by the introduction of long range weapons, the wars of the future are more likely to consist of a series of battles following in quick succession, as illustrated in the battle of Mukden, entailing an enormous amount of work upon the medical department of an army, because of the large number of wounded that will require immediate consideration.

It must also be remembered that it has never been practicable to obtain for the medical department of any army a sufficient number of

personnel to meet the requirements of war, and no matter how well organized, and how efficient the medico-military administration may be, there must always be a considerable number of wounded who will not receive prompt surgical care after a battle in which large numbers are engaged.

The truth of this statement is illustrated by the fact that after several battles of our Civil War all the wounded were not removed from the field for some days after the engagement.

The medical departments of all armies make the necessary preparations for field service—that is, for the care of the wounded during and after battle, by establishing of aid stations, dressing stations, field hospitals, and the assemblage of transportation for conveying the wounded from the field as rapidly as possible. In modern warfare this is a difficult problem because of the long range of rifle fire, for the reason that service in the rear is quite as dangerous as service at the front and the fire of the enemy cannot always be controlled by the exhibition of Red Cross flags, which he may, or may *not*, see.

The efficiency of modern fire-arms has a potent influence on the medical service in battle, and the character of wounds in an engagement is determined by the missile used. We all know that the old large calibre bullet made a more extensive wound than the modern rifle bullet, that under modern conditions, because of the small calibre of the bullet and its benign effect in the cases of flesh wounds, a larger number of wounded may be returned to the ranks; which, from the point of view of the military surgeon, is the most important consideration in preserving the efficiency of an army. Practically there is no difference between the military rifles of the different nations. All of them have a flat trajectory and all of them have long range, and it therefore becomes necessary for the medical officer to locate his aid stations as near the front as the military situation will permit, and as far as practicable in protected places, in order that he may be able to perform his work without great loss amongst his own personnel, or danger to the wounded men collected at the said stations for treatment.

To do this in battle is sometimes impossible, as the medical personnel must frequently do its work in the area of the danger zone—that is, within a distance of from 2,000 to 3,000 yards behind its own firing line.

There is no zone of safety in the immediate area of a low firing point, that is in a flat country, and under such conditions the collection of wounded during the progress of an engagement becomes more than a difficult problem.

What I have said heretofore applies to the fire of infantry only, since nearly all aid sta-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

tions, and dressing stations, come within the range of exploding shells and shrapnel.

In this connection it is well to remember that the percentage of casualties amongst the medical personnel is only exceeded by that of the infantry.

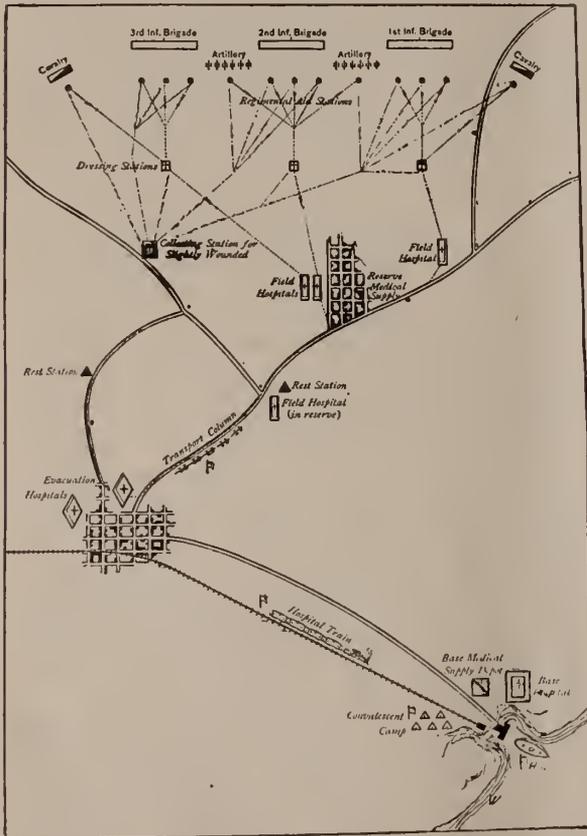
You will, therefore, perceive that the work of a surgeon on the battlefield is one of extreme danger, and that he must exercise his ingenuity and judgment in searching out places for the location of his aid and dressing stations by estimating the distance of the line of fire, which is frequently a changeable line, and, therefore, difficult to judge.

The statements made above are preliminary to the exhibition on the screen of the scheme of the administration of the medical department on the battlefield, and will to some extent show the difficulties encountered by the surgeon in caring for the wounded during an engagement.

These slides were photographed from cuts in "Medical Service in Campaign," by Major P. F. Straub, Medical Corps, U. S. Army.

First—This slide indicates the arrangement of our regimental aid stations, dressing stations, collecting stations, and field hospitals.

No. 1.

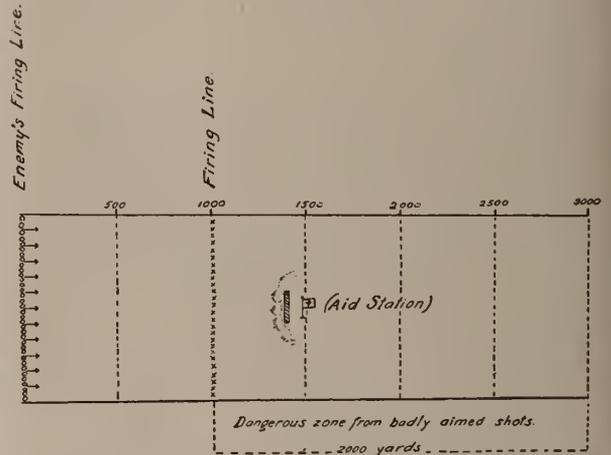


I consider the field hospital as the limitation, in the rear of our army, of the activities of the surgeon on the battlefield, but desire to

state that the evacuation and base hospitals have important functions in connection with the medico-military administration.

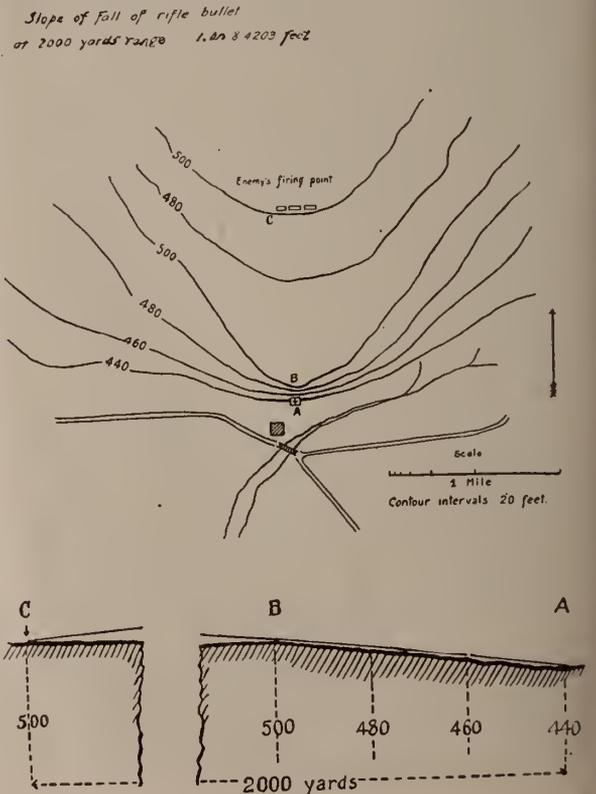
Second—This slide indicates the danger zone to the medical personnel and to the wounded of badly aimed shots, and shows the schematic arrangement of an aid station wherein the zone of safety is close to the firing line, while the area beyond that is one of danger.

No. 2.

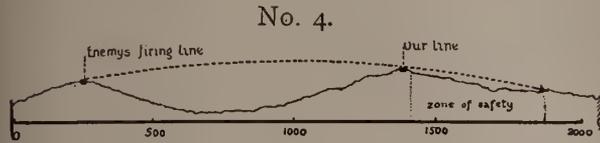


Third—This slide indicates the slope or fall of rifle bullets at 2,000 yards range. The zone of safety is approximately 500 yards, and the zone of danger 2,000 yards in the rear.

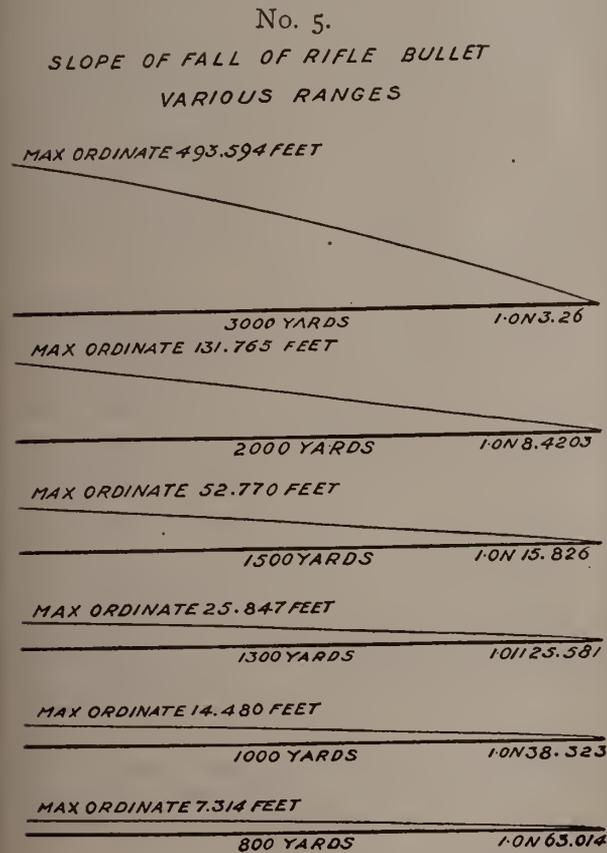
No. 3.



Fourth—This slide indicates another difficulty which surgeons must meet, as the zone of safety is within 1,500 yards of the enemy's firing line, and the zone of danger is between two and three thousand yards in the rear of our own line.



Fifth—This slide indicates the slope or fall of rifle bullets at various ranges. From a knowledge of the slope or fall the efficiency of cover afforded by rise of ground may determine the location of the aid stations.

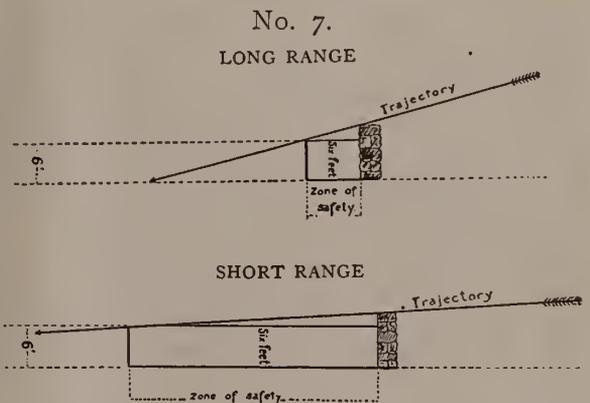
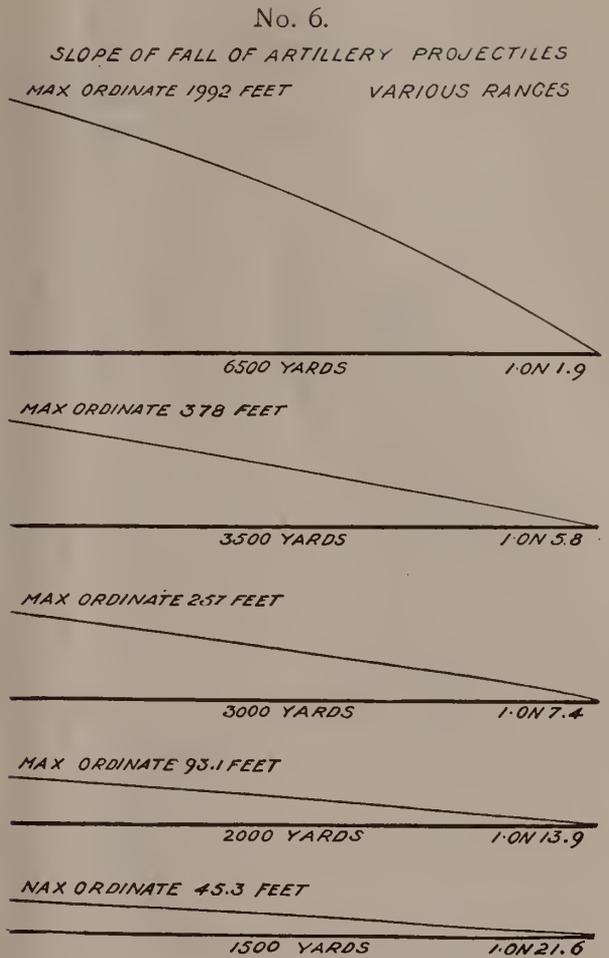


Sixth—This slide indicates the slope or fall of artillery projectiles at various ranges.

Seventh—This slide indicates an instance where the zone of safety is greater within a short range than at long range.

Eighth—This slide indicates the danger zone in case the enemy's fire is of shrapnel, or of high explosive shells.

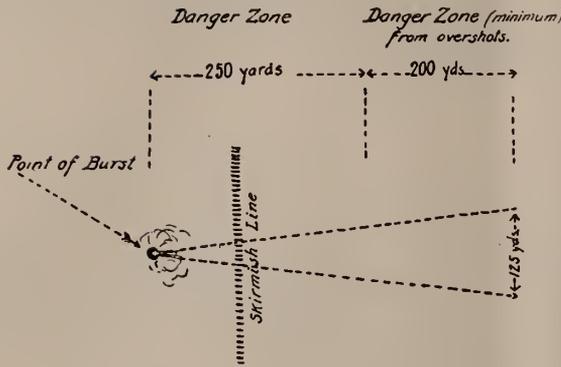
In the first instance the area of dispersion is about 250 yards for shrapnel, and for the shell about 30 yards from the point of explosion.



Ninth—The figures on this slide referring to the battles of our Civil War were taken from the medical and surgical history of the War of the Rebellion. Those relating to battles between foreign armies were obtained from Major Straub's work on "Medical Service in Campaign."

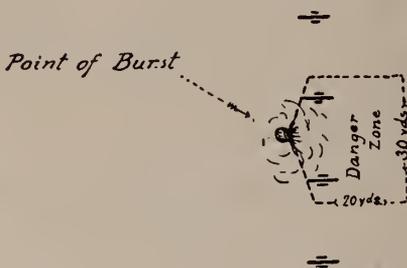
The statements of battle losses rendered by the military authorities of the countries engaged in warfare can be considered only as approximate, but they afford information in cal-

No. 8.
SHARPNEL.



Area of Dispersion 16° at medium ranges.

High Explosive Shell



Area of Dispersion 140°

culating the needs for the medical department in the wars of the future.

I will take two extremes of battles of recent times to illustrate my meaning: At the battle of Shiloh the percentage of killed in the Union Army was 2.67; in the Confederate Army, 4.27; and the wounded in the Union Army, 13.4; in the Confederate Army, 19.8. This battle occurred on the 6th and 7th of April, 1862.

At the battle of Mukden, February 23d to March 10, 1905, the percentage killed in the Russian Army was 2.9; in the Japanese Army, 4.41. The percentage of wounded in the Russian Army was 16.3; in the Japanese Army, 17.64.

These statistics illustrate that there is not the great difference between the destructive results of modern weapons and of those of the older type that one would be led to infer from the expressions in public print, but they do indicate the enormous amount of work thrown upon the medical department of an army in time of war.

During and after the battle of Shiloh, which lasted two days, the Union and Confederate surgeons were required to care for over 16,385 wounded men. At the battle of Mukden,

which lasted from the 23d of February to the 10th of March, 1905,—17 days—the Russian and Japanese surgeons cared for approximately 110,506 wounded men.

While the figures of statistical tables of battle losses furnished by the various governments are important, it must be remembered that the casualties of battle are not evenly distributed. In making the statement that the battle of Mukden extended over a period of 17 days, I have found it impossible to estimate the losses on any single day. The bulk of the work of the medical departments of the Japanese and Russian Armies may have been concentrated on a few of the 17 days, as we know nothing of the critical days of these battles. We do know, however, that one Russian army corps in a single battle lost 25 per cent. of its force, and that two Russian infantry regiments lost 61 and 66 per cent. respectively at Sandepu and Mukden; and that four Japanese regiments lost 39, 51, 62 and 68 per cent. in individual battles. These high percentages of loss indicate the high efficiency of the weapons in use, but in reality they are no greater than of the losses of some of the individual organizations during the Civil War in our own country before the days of the perfection of modern guns.

As an illustration of the work of our own medical department I will say, that in the Civil War the surgeons of a field hospital of the fifth army corps, one small medical organization of that corps, at the battle of the Wilderness, attended to 1,200 wounded men between one and nine P. M., on the 5th of May, 1864. Computation after eliminating all slightly wounded, allows only an average of eight minutes for each man on the operating table, 75 cases to each medical officer.

I only mention this in order that you may compare it with your own work in your own large civil hospitals, with a full corps of assistants, all the help that you may need, and the magnificent equipment of a modern operating room.

After that battle there were 180 cases of excision, and 560 amputations. The total number of wounded in the Union Army, the campaign covering a period of one month, was 16,331 men.

In this connection I desire to state that wherever practical, because of the short range of the rifle of that period, the medical officer of the Civil War began work on the battlefield within the danger zone, and continued thereafter during the course of an engagement. In the wars of the future the work of the surgeon on the battlefield will be limited to emergency cases, as the severely wounded will be sent to the rear as rapidly as possible. This change in the system of caring for the wounded will not, however, lessen the danger

No. 9.

Battles	Nation	Strength	Killed.	Per Cent.	Wounded.	Per Cent.
Shiloh, April 6-7, 1862.	Union.....	62,682	1,754	2.8	8,408	13.4
	Confederate..	40,335	1,723	4.3	8,012	19.8
Antietam, Sept. 16-17, 1862.	Union.....	75,316	2,108	2.8	9,549	12.7
	Confederate..	51,844	2,700	5.2	9,024	17.4
Gettysburg, July 1-3, 1863.	Union.....	83,289	3,155	3.8	14,529	17.4
	Confederate..	75,054	3,903	5.2	18,735	25.
Chickamauga, Sept. 19-20, 1863.	Union.....	58,222	1,657	2.8	9,756	16.8
	Confederate..	66,326	2,312	3.5	14,674	22.1
Wilderness, May 5-7, 1864.	Union.....	101,895	2,246	2.2	12,037	11.8
	Confederate..	61,025	2,000	3.3	6,000	9.8
Spichern, Aug. 6, 1870.	German.....	28,000	812	2.9	3,556	12.7
	French.....	20,000	320	1.6	1,660	8.3
Mars-la-Tour, Aug. 16, 1870.	German.....	66,300	3,275	4.94	10,277	15.5
	French.....	126,170	1,363	1.08	10,094	8.0
Gravelotte, Aug. 18, 1870.	German... ..	146,000	4,438	3.04	15,140	10.37
	French.....	125,000	1,125	0.9	6,713	5.37
Sedan, Sept. 1, 1870.	German.....	165,400	1,636	0.989	6,467	3.91
	French.....	108,000	2,981	2.76	14,008	12.97
Yalu, Apr. 30- May 1, 1904.	Russian.....	21,000	630	3.0	1,176	5.6
	Japanese.....	40,966	205	0.5	819	2.0
Liaoyang, Aug. 26- Sept. 4, 1904.	Russian.....	140,000	2,519	1.799	13,790	9.85
	Japanese.....	125,000	4,796	3.837	17,500	14.0
Mukden, Feb. 23- March 10, 1905.	Russian.....	310,000	8,990	2.9	50,530	16.3
	Japanese.....	340,000	14,994	4.41	59,976	17.64

of the medical personnel. It may interest you to know that even with the comparatively short danger zone of the rifle of 50 years ago, 115 of the Union medical staff were shot in battle, of whom 51 were killed. 285 medical officers died of disease.

The average percentage of battle casualties has been worked out and may be accepted, not as a mathematical demonstration, but as a fairly good working formula for the administrative medical officer who must endeavor to provide for the emergencies of the battlefield.

Major Straub in his work "Medical Service in Campaign" states that the proportion of the various categories of battle casualties may be estimated about as follows:

- 20 per cent. killed.
- 8 per cent. non-transportable.
- 32 per cent. requiring transportation: sitting up, 20 per cent.; recumbent, 12 per cent.
- 28 per cent. able to walk to dressing station and field hospital.
- 12 per cent. able to march to advance base.

In accordance therewith, of every one hundred wounded:

- 10 are non-transportable.
- 15 require transportation recumbent.
- 25 require transportation sitting.
- 35 are able to walk to the dressing station or field hospital.
- 15 are able to walk to the station for slightly wounded.

As an illustration, let it be supposed that a division has sustained a loss of 25 per cent. in battle, and the strength of the division, taken in round numbers, is 20,000 officers and men; the casualties would be distributed among the various classes as follows:

Killed	1,000
Wounded:	
Non-transportable	400
Requiring transportation	1,600
Able to walk to dressing station or field hospital.....	1,400
Able to walk to advance base..	600
	4,000
Total	5,000

In our Civil War the mortality of the wounded was 13.2 per cent.

In the Franco-Prussian War it was 11 per cent.

In the Russo-Japanese War it was 3.2 per cent. on the Russian side, and 6.8 per cent. on the Japanese.

It is fair to assume that the improvement as shown by these figures was due to modern surgical methods of treatment, and also to the fact that the small calibre bullet makes a small opening that is less liable to involve contiguous parts.

The surgery of the battlefield is that of emergency; the control of hemorrhage, the immobilization of fractures, and the application of antiseptic dressings to all wounds, as military considerations require that the field of action shall be cleared of wounded as rapidly as the circumstances will permit.

In the rear of the army ample provision will be made in the evacuation, base and general hospitals for the scientific treatment of all cases.

In this paper I have quoted from the statistics of the Medical and Surgical History of the War of the Rebellion, and I refer again to this work in order that I may state to this section that while the work of a medical officer of the Army is most important at the critical moment on the battlefield, his exacting labor continues after the engagement and during the whole campaign, a statement I hope you will someday verify by consulting the printed volumes.

Lest we forget the achievements and devotion to duty of the members of our profession as represented in the Civil War by the Army Surgeons, Union and Confederate, I will, in conclusion of this paper, quote from an address of the renowned Professor Rudolph Virchow, in 1879, in commendation of this work in which he states that from that war began a new era of military medicine.

"It has been sharp necessity, this keenest of monitors, which has opened men's eyes through the heaviest visitations, so that they are compelled to notice what, to speak accurately, they would not see. Yes, it is astonishing, what schools of suffering the armies have had to pass through before the truth became commonly acknowledged. Thus, in the Crimean war, the French army lost one man out of every three, in their whole army, and it is calculated that of the 96,615 men who forfeited their lives, only 10,240 fell before the enemy; about an equal number of wounded died in the hospitals. The rest, more than 75,000 men, fell a sacrifice to disease. In the American civil war, 97,000 men died in battle, and 184,000 from epidemics and sicknesses. What a huge mass of pain and suffering, what a sea of blood and tears stands re-

vealed in these figures. But also what a heap of fallacious regulations, of prejudices and misunderstandings. It is necessary to lay bare here the long list of these sins and mistakes; fortunately it is sufficiently well known in order to serve as a warning for others. But it must also be said that it was not necessity alone which exposed the evil and brought redress. That the French learned little or nothing in the Crimea, and the North Americans so much in their civil war, that from that date onwards begins a new era of military medicine—this depends not on the magnitude of the necessity which the Americans had to undergo, which in truth was not greater than the French underwent in the Crimea. It was far more the critical, genuinely scientific spirit, the open mind, the sound and practical intelligence, which in America penetrated step by step every department of army administration, and which under the wonderful cooperation of a whole nation reached the highest development that, relative to humane achievements, had hitherto been attained in a great war. Whoever takes up and looks into the comprehensive reports of the military medical staff, will be again and again astonished at the richness of the experiences chronicled therein. The utmost accuracy of detail, painstaking statistics embracing the minutest particulars, an erudite exposition comprehending every aspect of the practice of medicine, are here united in order to preserve and transmit to contemporaries, and to posterity, in the most thorough way possible, the wisdom purchased at so tremendous a price."

WOUNDS OF NAVAL WARFARE.*

By CHARLES F. STOKES, A.M., M.D., D.Sc., LL.D.

Surgeon General, United States Navy.

WHEN it is realized that gunnery in the United States Navy is 1,200 times more effective today than it was at the time of the Spanish-American War, it will be perfectly plain that new conditions have arisen demanding exhaustive study in order to meet the responsibilities of the Medical Department.

It is believed by those qualified to judge that a duel between two dreadnaughts cannot last over five minutes, as one or the other will be annihilated by that time. It is probable that a battle between two modern fleets of approximate effectiveness would not last much over twenty minutes, as by that time one or both would have exhausted its supply of ammunition.

Our new 14-inch guns have an effective range of fourteen miles, and we now fire upon mov-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

ing targets at a distance of nine and even ten miles in ordinary battle practice; the accuracy and rapidity of fire are amazing. Each of these monster rifles hurls a projectile weighing 1,400 pounds (2-3 of a ton of metal) at a velocity of 2,900 foot-seconds (about $\frac{1}{2}$ a mile a second), and develops a muzzle energy of 66,000 foot-tons. The powder charge for the 14-inch piece weighs between 350 to 400 pounds, and each monster shell carries, as well, a large bursting charge of high explosive, so that at the moment of impact its destructive effects may be as far reaching as possible.

The propelling and bursting charges of powder are made up of nitroglycerine, gun cotton, nitrocellulose, and a deterrent, yielding largely, as products of combustion, CO and NO₂, both dangerously poisonous gases, which have further complicated conditions aboard ship.

From the foregoing it will be apparent that in battle we shall have powder gases, not only from our own batteries, but from the explosions of shells hurled at us. Probably all the wounded will be more or less poisoned either by powder gas or smoke, a grave menace to life and a serious, complicating handicap to military effectiveness.

That the seriousness of the menace from smoke is fully appreciated is apparent from the fact that the smokestacks of the new battleships carry thirteen inches of armor. A stack perforated low down or between decks might drive everybody out of the fire room, or asphyxiate all serving there.

From the composition of powder gas it is evident that we shall have two types of poisoning, one resembling illuminating gas poisoning, the other irritative in its effects. Both may vary in degree. In the one group, in mild cases, we find dilatation of the pupil, impaired vision, a fall in blood pressure, a rapid heart action, and possibly some mental confusion. These conditions are likely deleteriously to affect the fighting efficiency of our men. A larger dosage of powder gas may lead to unconsciousness and death. As the complicated structural peculiarities of our battleships necessitate the employment of artificial ventilation, it is evident that should we run our ventilating systems during battle the best ventilated space at once becomes the most dangerous from powder gas contamination. After the Battle of the Sea of Japan, Russo-Japanese War, on board a ship that had run its ventilating system during the fight, every person in one compartment was either dead or unconscious.

It is probable that the undue proportion of prostration attending shell wounds, formerly attributed to shock, is really due to gas poisoning, and not to injury alone.

Shells are masses of steel with conical tips containing a detonating mechanism which, on impact, ignites a bursting charge, thus disrupting the shell into scores of fragments which shower

a conical-shaped area from this point onward by reason of the momentum of the mass. Objects hit by oncoming shells are often set in motion, thus becoming secondary missiles. The shell fragments vary in size, with edges generally rough and jagged, are of comparatively low velocity and usually so hot as to sear the tissues when they lodge. The battery of a *single* ship may throw ten or more tons of metal per minute against the side of another; the accuracy of fire these days justifies the belief that the percentage of misses will be small.

To offset this offensive development the vitals of the ships are placed behind heavy armor, and all objects that can be dispensed with likely to explode shells or become secondary missiles have disappeared. The so-called basket masts of the American navy aim to withstand shell fire without falling and without exploding shells.

In a single ship we must plan for a casualty list in killed and wounded of from 20 to 30 per cent.; as a matter of fact, in a single ship during an action in the Sea of Japan 50 per cent. of the crew were killed or wounded.

From the nature of the projectiles already described, the seriousness of the wounds of naval warfare is evident. Whole limbs may be torn off, disembowelling may take place, or the entire body be peppered with small fragments. As the velocity of the fragments is relatively low, lodgment is common, and impact against bone frequently cause splintering. Practically all shell wounds are infected by reason of their extent, character and contaminating surroundings, and they are usually seared as well.

Burns from exploding shells and fire, and scalds from damaged steam pipes add to the horrors of the situation. A detailed consideration of these injuries is beyond the scope of this brief paper. Shell wounds involving bones and the nervous and vascular systems teem with interest. The frequency of traumatic aneurysms may be appreciated when it is known that in one hospital a Japanese surgeon operated upon one hundred and ten cases during their last war.

It may well be asked what has the Medical Department done to meet these appalling responsibilities of battle? Our activities may be grouped under three heads, preparatory, actual battle activities, and after care. Under the first head comes drilling in first-aid, which is now given to all men at least twice a week by their line officers; this is a new and important measure; the preparation of equipment and assembling of supplies and necessary personnel. The men are required to bathe and to shift into clean clothes before going into action; in fact, they do this before battle practice. We surgeons know that this measure is not likely to prevent infection; still, it may lessen it to some extent. It certainly has a very desirable steady effect on the men.

During battle the aim of the Medical Department is to keep as many men at their stations as possible. It is doubtful if any humanitarian activities can, or should, be engaged in. The men will have to lie where they fall, receiving such care as may be at hand, until the action is over.

After a fight, or during a lull, we might have, in a fleet the size of our Atlantic Fleet, anywhere from 5,000 to 10,000 killed and wounded on our hands, and possibly those of the enemy as well. The Medical Departments of the ships would be unable to cope with this tremendous responsibility. Outside medical assistance becomes imperative. It is probable that Congress will authorize the establishment of a Naval Medical Reserve Corps, to be made up of surgeons, and others, of high standing and conspicuous ability in the medical profession. These surgeons will be grouped under the Red Cross on great medical transports, each capable of carrying 1,000 wounded. They will have under them a sufficient number of assistants and ample equipment to meet the demands of the occasion. The dressings and occlusive and immobilizing devices will be conveniently packed so as to be readily carried to the fighting ships.

During a lull in an action, or after the battle is over, these surgeons will go on board the fighting ships, prepare the wounded for prompt transfer to the medical transports, and give them such other treatment as may be imperatively indicated. A rapid removal of the wounded may become a most important military procedure in case the fleet were to re-engage.

The apparatus that has best fulfilled the requirements for safe and comfortable splinting and transportation in the navy is the splint stretcher devised by the writer and now in use in the United States navy and in many other situations. The difficulties encountered in removing the wounded from ships of war, by reason of their structural peculiarities, are in a class by themselves. The splint stretcher is especially adapted to handling severe bone injuries of the extremities and to transporting unconscious or collapsed persons. It appears to be an ideal apparatus for use in the fire departments of our cities, where injured or unconscious persons may have to be removed from tall buildings or situations difficult of access. There is a large field for its use in the merchant marine. It is already in use in mines and as a part of railway relief equipment.

Two great sanitary bases have been planned for, one for the Atlantic and one for the Pacific, and as far as possible every detail of personnel and equipment has been worked out. These are the great collecting stations for wounded. With the legalizing of the Naval Medical Reserve Corps, I shall probably look to the Medical Society of the State of New York for a large body of recruits for this organization.

SURGERY OF THE BILE DUCTS.*

By JOHN B. DEAVER, M.D., LL.D.,

PHILADELPHIA, PA.

I WISH to thank my friend, your distinguished chairman, delegates and to express my great pleasure in being honored by the invitation to address this body of New York State doctors upon the surgery of the bile ducts.

It can truly be said that our present knowledge of the pathology of the abdominal viscera, and particularly of those of the upper abdomen, is directly due to the development of modern abdominal surgery. And foremost among these structures whose diseased conditions have been made manifest by surgery we can consider the biliary system with its accessory organs, the gall bladder and the bile ducts, and the pancreas.

I have dwelt many times upon the importance of living pathology, the direct examination of diseased processes in vivo, the opportunity for which has caused it to be truly said that the internist walks by faith, the surgeon by sight. The study of living pathology enables the surgeon, and the internist if he will avail himself of its opportunities, to distinguish fundamental conditions from end results. It enables us to attack pathological conditions in their incipiency and often to diagnose them at a time when treatment will still be of avail.

Surgery of the bile ducts, in association with the work of men in the laboratory, has demonstrated that with the exception of malignant disease all the conditions which call for surgical interference upon any part of the biliary tract have their origin in infection. Even malignant disease, though probably not itself of infectious origin, seems to bear some relation to antecedent infectious processes since it is found most often in organs which bear the traces of previous inflammation. The long train of biliary disease with its complications and sequelæ has therefore as its one exciting factor the harmful activity of pathogenic micro-organisms.

The infecting agent may reach the biliary tract in a number of ways, but it seems likely that it generally arrives by way of the portal circulation. There is no doubt however that micro-organisms may enter the biliary tract directly from the duodenum and this seems to be the case in those instances of cholecystitis and cholangitis directly consequent upon an intestinal catarrh.

Whatever the route of infection a number of organisms are concerned in the production of biliary disease, each one of which alone or in combination with others gives rise to many different pathological conditions.

As a general rule it may be accepted as proved that low grade infections by micro-organisms greatly attenuated give rise to gallstone disease,

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, N. Y., April 17, 1912.

or cholecystic inflammation with the formation of stones, while acute invasions of the biliary tract by organisms of high virulence give rise to acute forms of cholecystitis, cholangitis and their accompaniments too rapidly to permit of the formation of stones. Such acute infection again may partially subside and be converted into a sluggish stone-forming catarrh.

As has been mentioned, no one form of disease of the biliary tract can be identified with a particular organism. Thus, of 142 operations in 1911, on the biliary tract for various lesions, 34 showed *B. coli*, 50 showed no growth, 46 not mentioned, 2 showed *B. typhosus*, 7 showed *staphylococcus albus*, 1 showed *streptococcus*, 1 showed *B. pyocyaneus*, 1 showed *B. ærogenes*. It is worthy of note that in many instances where infection was evident, *i. e.*, in the presence even of pus, cultures showed no growth. Either the organisms present were not such as could survive upon ordinary culture media, or that which seems more likely, the offending bacterium had died out while the products of its activity remained.

The preponderance of the colon bacillus is not remarkable. It is a well known fact that this organism is at all times present in a large portion of the alimentary tract and that most infections of a portion of this tract soon become a mixed one in the presence of this widely distributed and hardy organism. The colon bacillus then overgrows the original invader and alone is found when the case comes to operation. This fact together with the ease with which this organism is cultivated and identified probably gives it a statistical importance somewhat beyond its actual deserts. There can be no doubt, however, that the colon bacillus may be the infecting organism at the outset and by itself may produce all the varied consequences of infection of the biliary system.

In other series the bacillus typhosus has been found in a greater percentage of cases. Thus in 182 cases of cholelithiasis, reported by me in 1906, there were cultures made in 94 and of these, 13, or one-seventh, showed the presence of the typhoid bacillus. In one instance this organism persisted 41 years after the original infection. We have found this organism in the gall bladder in cases where the most careful inquiry failed to elicit anything like a previous attack of typhoid fever. I have known typhoid fever to immediately follow an operation for the removal of stone from the gall bladder where cultures from both the gall bladder and the interior of the stone removed showed the typhoid bacillus.

These figures are of interest in view of the possible role of the bacillus typhosus in the causation of cholelithiasis. It has been found that a large proportion (in this series 22 per cent.) of gallstone cases give a history of having had typhoid fever, and it seems in many of these as if we could directly trace the beginning of symp-

toms referable to the biliary system to a period not long after the typhoid infection. The typhoid bacillus has repeatedly been demonstrated in the centre of biliary calculi and it is probable that it bears a closer relation to the origin of biliary disease than the study of cultures at the time of operation would indicate.

Each organism of the small series given, and others also, has been found capable of giving rise to the most diverse conditions within the biliary tract, and no special set of changes can be charged to any particular organism.

In contradistinction to the old view that most cases of gallstones are without symptoms we know now that all of them have symptoms and most of them very evident ones. We have learned that infectious conditions giving rise to marked pathological changes in the right upper quadrant of the abdomen are not different from similar processes in any part of the body, that they must and do make themselves known by symptoms needing only correct interpretation to make a diagnosis certain. As our diagnostic powers improve and surgical cure is more often sought we shall meet with fewer and fewer instances of the extensive complications found in so many cases of this series, just as it is rare nowadays to find an instance of the huge ovarian cysts formerly so common and so spectacular from the operative standpoint.

Since infection is the underlying cause of biliary disease we must rely in this as in other cases of infective disorders upon that great surgical principle of the treatment of infection—drainage. And we have demonstrated that the biliary tract is no exception in yielding to the correct application of this principle. Every operation upon the biliary ducts must serve a double purpose; it must meet the immediate mechanical demands of the conditions found, and it must furnish drainage for a sufficient length of time to cure infection.

Could we get these patients in the early stages of the disease there would be nothing to meet but the infection, in other words cholecystostomy would suffice; a simple operation quickly performed and, with proper care in the selection of patients, almost without mortality. It is a high aim to get our cases in this stage but is not too high and should command the united efforts of the profession. Unfortunately it is in just this stage that the disease is most difficult of diagnosis, the physician most reluctant to advise and the patient to accept operation. The same educational campaign which has won such a signal victory in appendicitis must now be carried on in this field. All cases of indigestion should be most carefully scrutinized for the evidence of localization in the gall bladder. Slight epigastric distress, occasional tenderness in the right hypochondrium, sometimes accompanied by a slight rigor, a catch in this region during inspiration, excessive flatulence, and belching, "bilious at-

tacks," and at intervals perhaps a faint icteroid tinge in the skin without definite jaundice, a perceptible increase in the tension of the upper right rectus muscle as compared with its fellow, indigestion, so-called, not definitely associated with the taking of food (in this series 64.7 per cent. had "indigestion" of varying degrees either before suffering from acute attacks or in the interval), all these are highly significant of beginning disease of the bile passages. I will grant that such symptoms do not at once call for operation but they call for most careful supervision and not the casual notice with which the profession has to its disgrace hitherto treated them until the laity has come to disregard such symptoms and often fail to seek the advice by which many cases could be aborted.

This is the field for medical therapy, for Carlsbad treatment if the patient can afford it, not those later complicating conditions, the treatment of which by the physician is no more promising or rational than is that of the quack who either dissolves the stones or evacuates them in the form of soap balls after huge doses of oil.

The time of election for operation is when medical treatment of the inaugural symptoms previously mentioned fails to control them or when they recur after supposed cure. Failing this, we have introduced into the situation an almost innumerable variety of factors dangerous to the patient's health and life, and for the surgeon a source of difficulty, of mental anxiety and disaster to his ambition for enticing statistics. The most common result of infection is gallstones. The mild cases of infection are more dangerous in this respect than are the acute infections, for it is the low grade catarrhal inflammation which causes desquamation of the lining epithelium, the production and deposit of cholesterolin and biliary salts which result in stone formation while more virulent processes do not at once cause stones, though they do give rise to other and perhaps more dangerous conditions. Later when the process becomes subacute or chronic, stones may be found though not invariably. So long as the calculi remain in the gall bladder the conditions are still practically ideal for operation. It is their further wanderings into the cystic, common or hepatic ducts that give trouble alike to surgeon and patient.

The next complicating factor in order of frequency is adhesions. In this series they were present in about one half the cases (45.4 per cent.). They are the result of pericholecystic or periduodenal inflammation. They are conservative so far as life is concerned but they are often destructive to function. As I have stated some years ago, "in many cases the symptoms and gravity of gall bladder lesions are due not to the gall bladder affection proper *per se* but to the accompanying adhesions."

I believe that pericholecystic adhesions the result of gall bladder and duct infection often give

a clinical picture which is identical with that found in gallstone disease, and do so in the entire absence of gallstones at any time, and after operation they are capable of causing symptoms which mimic gallstone colic. In one case in this series the duodenum was constricted almost to the point of absolute obstruction by a band emanating from a previous infection of the gall bladder, and in another the outer portion of the wall of the duodenum was invaginated and adherent. Aside from certain congenital abnormalities of the peritoneal attachment adhesions in the abdomen are always the result of inflammation and they may give rise to the most baffling but distressing symptoms. Abdominal adhesions are very unsatisfactory material for surgical treatment since they are apt to reform after operation and it is largely a matter of chance whether their new situation will be any more favorable for the patient. Hence the importance of eliminating by early operation this source of dissatisfaction with operative results.

It is impossible to treat fully in a short paper of the various clinical results of these processes. Ulceration, infiltration, perforation, gangrene, cicatricial contraction, and stenosis all are common and affect in various degrees, the different portions of the gall bladder and ducts. In one case I observed a spontaneous cholecysto-gastrostomy in the process of making, a stone being still lodged in the opening from the gall bladder to the stomach. In another case stones were imbedded in the stomach wall which had not been perforated. In still another instance the patient came with a sinus in the right side of the abdomen which had discharged gallstones, Nature thus having effected what the surgeon could have done before with far greater safety to the patient. To permit such conditions as this to arise may be called conservative treatment, though just what it conserves is a mystery. In this field if not in politics we should all be progressives.

Last and not least we may have as a result of gall bladder infections, or as a result of the same infection attacking the pancreatic tract, a pancreatitis, acute or chronic. Acute pancreatitis demands consideration as a separate clinical entity. But chronic pancreatitis is so often found co-existent with biliary infection that it may truly be considered as a part of the clinical picture of biliary infection. It is unlikely that pancreatic lesions are the result of direct extension of infection up the pancreatic ducts. Far more important it has seemed to me, is the extension by way of the lymphatics. The hardening of the head of the pancreas so often noted during operations on the biliary tract is due in its earliest stages at least to lymphatic infection and congestion and is possible of relief by drainage. Our views concerning the nature of these swellings of the pancreas and their origin are set forth in an article by myself and my assistant, Dr. Pfeiffer,

in the current number of the *American Journal of Medical Science*. How important is the early relief of this condition must at once be evident. To restore a chronically diseased appendix to normal after the deposit of dense fibrous tissue is impossible by any means now at our command. Most, if not all, of these instances of pancreatic change which have been so wonderfully benefited by operative procedures must have belonged properly in the category of pancreatic lymphangitis and were not, properly speaking, cases of chronic pancreatitis.

But nevertheless it seems likely that such a pancreatic lymphangitis is the forerunner of a true chronic pancreatitis and if we are able to cure the underlying condition we may be said to cure the final one by preventing it. In this sense I believe that diabetes is at times a surgical condition. While the pancreatitis induced by infections of the type under discussion does not often destroy sufficient of the islands of Langerhans to cause diabetes, there is sufficient clinical and pathological evidence that they may do so and thus a timely operation may be the means of avoiding this dangerous condition. I have on more than one occasion seen glycosuria clear up after a successful drainage of the infected biliary and pancreatic ducts.

It is evident then that by timely operative procedures upon the biliary passages we are able to do far more than simply to remove a few gallstones or loosen a few adhesions. We are able to apply the principle of drainage to infections here as in other parts of the body, to cure first causes, to do away with the harmful results of invasion by pathologic bacteria.

Aside from traumatic and neoplastic affections of the biliary ducts the conditions calling for surgery may be grouped as follows:

1. Non-calculous cholecystitis.
2. Calculous cholecystitis and its complications.
3. Pancreatic disease.

In non-calculous cholecystitis there is but one problem—to remove the results of inflammation and to insure sufficient drainage for a proper length of time. The gall bladder may require removal if gangrenous or inordinately thick and functionless, though I attempt to preserve it in all cases.

Pancreatic disease furnishes a strong indication for temporary or permanent drainage of the biliary tract, temporary by direct tube drainage or permanent by some form of anastomosis between the biliary system and the alimentary canal to give greater drainage than the natural outlet affords. In my practice this has generally consisted of cholecysto-duodenostomy. Of the methods of treatment of pancreatic conditions found at operation I shall speak more at length later.

Kocher's oft-quoted remark that, "Gallstones belong neither to the surgeon or to the physician, they belong to the patient," is quite correct. It is

indeed the patient's privilege to have his bodily ailments treated in such a manner as he sees fit. Yet, were every gallstone patient informed of the possible results of his condition, and shown the difference between the mortality and end results in early and late operations there is but little doubt in my mind that he would quickly turn to surgery for relief.

What, then, are the indications for operation in disease of the biliary ducts and the gall bladder?

1. More than one attack of true biliary colic.
2. Symptoms suggestive of upper abdominal adhesions and chronic biliary insufficiency.
3. Hydrops of the gall bladder.
4. Obstruction of the common duct.
5. The occurrence of acute infections complicating previously existing biliary disease.
6. The evidences of pancreatic disease, acute, subacute or chronic.

No physician or surgeon of the modern school expects to see more than a fraction of his gallstone patients come to him with a history of biliary colic. Numbers indeed give a fair approach to a classical history of gallstones but the majority give a far vaguer combination of symptoms often with, but at times without, any history of jaundice.

In comparison with the total number of cases suffering from gall stones or their effects, classical cases are few. I sometimes think that the simple rule "fair, fat and forty and belches gas" would be a safer maxim for our students if we wish them to recognize gall bladder disease than is the hard and fast clear cut picture so faithfully embalmed in most of our text books.

Just a word about the age at which the gall bladder is likely to be infected. We have been taught that it is a disease of the later years. The average age of the 142 patients was 40.8 years. The average duration of symptoms was 6.6 years. On the average then these patients were but 34 years of age when known to be infected. In other words the beginning of the condition is in early adult life and the reason why it has been considered a disease of the declining years is because the early symptoms go unrecognized until the accumulation of pathology forces a diagnosis and treatment. Six and a half years is too long for the physician to ponder over a case that is trending towards operation as the only relief of his ills. An interesting feature of cholelithiasis is the liability to recrudescence after labor. In the present series there are three instances of gallstone colic following immediately after parturition. All had had symptoms of gall bladder disease previous to the last pregnancy. These attacks were the most severe that the patient had experienced.

Pain that could be called biliary colic was present in 80 per cent. of the cases; jaundice in 47 per cent. These percentages are high in any operative series since they are striking,

severe and of an order to induce the patient to seek operative relief. Bearing this in mind it is apparent how relatively infrequent a symptom of gallstones these vaunted symptoms really are. A low incidence of these symptoms in the operative figures of a surgeon is a tribute to the intelligence of the profession among whom he labors.

The second group of these cases in which I consider operation indicated, *i. e.*, those with symptoms of upper abdominal adhesions and chronic biliary insufficiency, is a large one. It includes many gallstone cases and others of non-calculous cholecystitis and cholangitis which in former years would have been called symptomless because of the absence of pathognomic signs. And although we find in these patients no such absolute indication for operation as the occurrence of biliary colic, yet I maintain that a carefully taken history will localize the trouble in the biliary tract and that the surest cure is drainage.

Hydrops of the gall bladder and obstruction of the common duct give symptoms which are quite definite and well known and it is necessary only to mention these conditions to make our statement of operative indications complete. It must not be forgotten that one or more stones may be present in the common duct without causing jaundice and it has been my experience to find this condition in 3 out of 32 cases operated upon in the University Hospital in the last year and a half. Needless to say this is the most favorable time for operation upon stone in the common duct.

In common duct obstruction I prefer to operate in the interval between attacks of complete occlusion. What surgeon does not prefer to have his patient in the best possible condition for operation? I take issue, however, with those surgeons who, seeing a patient during acute obstruction, decide to wait until the obstruction has been relieved before operating. This may be very good for the surgeon's results since he is relieved of the necessity of operating upon certain of the more severe cases who will seek operation elsewhere when the condition instead of improving becomes worse.

I do not, of course, advocate operation in every case of acute obstruction of the common duct during the attack of colic nor during the few days immediately following, but I do not always wait for the subsidence of jaundice for at times this does not occur until the patient is emaciated and weakened in the extreme, to say nothing of the adhesions, etc., generated by the infection. The time to be of most service to a patient with obstruction of the common duct is during the existence of the obstruction when by operation we may come to the rescue of the liver and inflamed bile passages. After the first few days there

is no greater danger of causing infection of the peritoneum than subsequently. Hemorrhage, one of the greatest dangers, does not occur in the early stages but only in the cases where a cholæmic state has existed for a long time. In all cases where I fear hemorrhage I fortify the patient with injections of blood serum preferably obtained fresh from a healthy member of the family. Large doses should be used; from 50 to 200 cc. given subcutaneously. I believe serum is of value in this connection. Human serum is preferable to that of the horse or other animals for obvious biological reasons. Gelatin is useless for the prevention of capillary oozing and the salts of calcium, while they may effect a reduction in the coagulation time of the blood do not appear to have much influence upon cholæmic hemorrhage.

The evidence of pancreatic disease points also directly to the need for operation. Unfortunately it is most difficult to be sure of this condition. Chronic pancreatitis, so often associated with disease of the biliary tract only occasionally gives rise to symptoms which could not just as well be accounted for by gallstones or chronic non-calculous cholecystitis.

When, however, the character of the stools, with an intermittent diarrhœa and constipation and those grave metabolic changes attributable to pancreatitis, give evidence of pancreatic disease, I consider operation indicated even in the entire absence of symptoms pointing to disease of the biliary tract. Particularly is this true when to the symptoms mentioned we have added a glycosuria. In the present series the pancreas showed recognizable lesions chiefly of the nature of pancreatic lymphangitis in 45 cases (32 per cent.). In three of these there were some flecks of fat necrosis in the vicinity revealing the presence of an acute exacerbation of the chronic inflammation.

I have had the Cammidge "C" reaction performed in 84 cases of the present series with the following results:

Pancreas involved—Cammidge, positive, 9; Cammidge, negative, 20.

Pancreas uninvolved—Cammidge, positive, 8; Cammidge, negative, 48.

This is a poor showing for a pathognomonic reaction and I can therefore place no dependence in it, as these results substantially correspond with about 400 previously obtained in the laboratory of the German Hospital in these and other conditions.

Operations must accomplish three things:

1. It must meet the actual pathological condition and relieve it.
2. It must remedy if possible the underlying cause.
3. It must if possible prevent a recurrence

of the conditions found by rendering the return of the cause unlikely to occur.

1. The actual pathological conditions met with in surgery of the bile ducts consists of three great groups:

a. Infection.

b. Calculi.

c. Of adhesions about, and malformation of the gall bladder and ducts as a result of infection.

Gallstones when found are to be removed, of course, it matters not in what part of any duct they may be and it is as a rule possible to do this if the operator be competent and patient. Their removal from the gall bladder and cysticus is generally a matter of small difficulty, unless the stones are very small and buried within the mucosa of the gall bladder or in a diverticulum.

The removal of a stone from the choledochus is often a matter of great difficulty, particularly if it be situated in the retroduodenal or the intraparietal portion of the duct. When the stone is in the first portion of the common duct, or can be pushed into it, the method of removal consists in direct incision of the duct over the stone and its removal. When the stone is in the second or third portions of the duct an effort should be made gently to bring it up into the more accessible supraduodenal portion of the duct, or failing in this, to dislodge it into the duodenum. Retroduodenal and transduodenal methods of approaching stone in the common duct are distinctly more dangerous than simple choledochostomy and only very rarely necessary. At times a soft stone which is lodged in the lower extremity of the duct may be broken up and removed piecemeal with the gallstone scoop. I am never satisfied until I can pass the olive pointed end of a good sized gallstone explorer through the papilla of Vater into the duodenum. Stones which have worked their way upwards into the hepatic ducts are very difficult and at times impossible of extraction. These are one cause of the recurrence of symptoms after the removal of common duct calculi and is a possibility that we cannot control. As a rule the downward flow of bile keeps the stones in the lower duct where they can be removed.

A point of some importance in connection with surgery of the common bile duct is a variation from the normal in the formation of the choledochus in which the cysticus and hepatic join near the duodenum, and the hepatic duct entering posteriorly appears much as a branch of the cystic duct, the latter seemingly being continued directly into the common duct.

In addition to the removal of gallstones in calculous cases we must make certain that embarrassing pericholecystic adhesions are freed. It is not always advisable to release all the ad-

hesions when the lesion can be satisfactorily dealt with without doing so. The continuity of the bile passages must be established or provision made for the proper discharge of the bile.

The removal of adhesions and attention to the state of the biliary ducts constitute also the main features in surgery of the actual pathology of non-calculous cholecystitis, which presents in every way the problems of gallstone disease minus only the actual presence of the stones.

The remedying of the underlying cause of disease of the biliary system, when not malignant, depends upon our ability to combat infection in this field. Since infection is the direct causative factor in all the lesions with which we have to deal it is only when we successfully meet it that we can be certain that everything possible has been done for the relief of the patient.

And, as in infection in any other part of the body our reliance must be upon drainage, this must be our watchword particularly in biliary surgery, for since infections here are so persistent in their course and insidious in their harmful action it is essential that nothing be left undone for their final cure.

I believe, therefore, that in every operation upon the gall bladder it should be drained, granting that the viscus is not diseased to the extent of having rendered it functionless.

Drainage of the common duct is imperative when we have opened it for stone, in all grades of cholangitis and particularly after cholecystectomy in the presence of liver infection and pancreatic involvement even when there are no stones in the duct. H. Kehr (*Arch. f. Klin. Chir.*, 1912, v. 97, 2 p. 301) recommends that the choledochus be drained after cholecystectomy when there is

1. Thickening of the pancreas, especially of the head.
2. When the choledochus is thickened and distended.
3. With a history of icterus, chills and passing of stones.
4. When a considerable amount of the cystic duct is left and it is split to the common duct.
5. When many small stones are found in the gall bladder and cystic duct causing suspicion of similar ones in the common duct.
6. Drainage of the hepaticus when cloudy pus oozes from the stump of the cystic duct, proving infection of the choledochus.
7. In the presence of liver enlargement, indurated liver and cirrhosis.

With these indications for common duct drainage after cholecystectomy I fully agree.

All cases of infection of the biliary passages unless very transient or coming as intercurrent affections in acute illness demand drainage of the gall bladder. Of these any that show marked infection or a cholangitis demand common duct drainage also.

For stone in the gall bladder I consider chole-

cystostomy the best operation. It has a slightly lowered mortality, followed by fewer adhesions than cholecystectomy and leaves the gall bladder as a possible future drainage outlet in case of serious biliary or pancreatic disease. Excision of the gall bladder I practice in cases of

1. Malignancy.
2. Hydrops of the gall bladder.
3. Chronic empyema of the gall bladder.
4. Gangrene.
5. When the cystic duct is not patulous.
6. When many small calculi are imbedded in the gall bladder mucosa.

When in the course of an operation upon the biliary tract we find a pancreatic lymphangitis or a beginning pancreatitis drainage is invariably indicated. If the gall bladder is greatly diseased and full recovery doubtful in a case complicated by pancreatic lymphangitis I consider it an indication for cholecystectomy. Drainage of the common duct should then be established. There is no doubt that the pancreas may be drained through the opening in the common duct as I have noted the peculiar irritating character of the discharge in certain of these cases. In an instance seen within the last month the patient's skin was severely excoriated by contact with the discharge from the common duct and the presence of pancreatic ferment was proved by the digestion of blood serum and starch in alkaline solution. In this case I had passed a good sized gallstone explorer through the ampulla of Vater and had no doubt of its patency. When the pancreatic duct does not open into the sinus of Vater of course this avenue of drainage of the pancreatic secretion is not possible, but the operation is still productive of good in that the primary focus of infection in the gall bladder is abolished.

If the lesion be primarily of the biliary ducts, common duct drainage will be sufficient, though temporarily, to meet the indications furnished by the pancreatic condition.

If the pancreatic condition be the main one or is the one causing symptoms, permanent drainage by a cholecystoduodenostomy is indicated, and it has been a procedure most brilliantly effective.

The surgery of the biliary tract has been made most satisfactory from the standpoint of operative mortality and end results.

In conclusion may I be permitted to urge upon my hearers the danger of procrastination and too much deliberation. It is well known that he who deliberates is lost but under these circumstances it may be the unhappy lot of the patient to be numbered among the lost. It should be mortifying to the physician to see the disastrous results of infection laid bare, to say nothing about the mortification of the patient. The full story of the autopsy *in vivo* has not yet been told. The new pathology is now being written.

The dawdling with duodenal buckets, falla-

cious laboratory methods and so forth I deplore, and could the patient be educated to their uselessness he too would despair. The resources of surgery are rarely successful when practised upon the dying, nor are they so uniformly successful when pathology is advanced as when it is in its incipency.

At least nine-tenths of the mortality of operation so-called is in reality the mortality of delay. Bearing this in mind we must face the problem of the reduction of invalidism and death due to biliary infections in the hands of him who sees the patient first, viz., the family physician.

BILIARY COLIC WITHOUT GALL STONES.*

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THE diagnosis of lesions in the upper right quadrant of the abdomen, considered merely from the Sherlock Holmes' aspect of the problem, is always interesting.

Frequently we unravel the clues as skillfully as he does (on paper); sometimes we acknowledge ourselves completely baffled, but more often, a clue apparently fresh and clear leads us to an absolutely innocent party, and but for the operation, when we have the entire theater of action open before us and the various *dramatis personæ* disclosed to view, we would be unable to pick out the offender.

Of this entire company the gall bladder is most frequently the guilty party, and yet, when all the evidence seems conclusive that there lies the trouble we have to admit many times that we are in error and make our apologies (not to the suspected party) but to the patient and family physician.

If, after such an experience, we carefully retrace the history in the light of the living pathology discovered at the operation we shall often find that either by inattention to details or to slighting one fact or unduly emphasizing another we have, unconsciously but surely, misled ourselves and obtained a history that at the time seemed perfectly rational but which later evidence proved to be untrue.

This must impress us with the fact that it is an art to get a full and accurate history from any patient in which each fact shall have its proper place and its proportional share of importance.

When chronic gall bladder affections, ulcers of the stomach and duodenum, chronic ailments of the pancreas, give so many symptoms, more or less similar in character, of indigestion in its manifold aspects of nausea, vomiting, constipa-

* Read at the annual meeting of the Medical Society of the State of New York, April 17, 1912.

tion; of distress or pain localized or referred; and the one particular ailment differentiated from the others by symptoms which vary almost imperceptibly as to time, place and degree, it becomes necessary to determine, as far as possible, the various symptoms—complex for each lesion.

With this purpose in view I wish to examine the pathology and symptomatology of that condition of biliary colic in which we do not find the gall stones for which we so confidently operated but some other lesion closely allied to it and although demanding the same kind of treatment, none the less different.

ETIOLOGY AND PATHOLOGY.

Biliary colic is a painful, reflex spasm of the gall bladder and ducts caused by obstruction to the passage of their contents, whatever the nature of the contents may be.

The causes of biliary colic are found in changes in the contents of the gall bladder, as where the bile becomes thick, viscid or "tarry;" when gall stones form or when foreign bodies may be present (hydatid cysts, blood clots). Soleri (*Revue de Chir.*, April, 1911). By changes without the gall bladder and ducts by pressure upon or kinking of the cystic duct due to adhesions, enlarged lymph nodes or new growths. By changes in the walls of the ducts by which they become stenosed, from inflammation or growths. In some cases nothing but a thickening about the head of the pancreas is recorded.

In this connection I would like to state that I have produced several times in different patients a mild but typical attack of biliary colic similar in all respects to that complained of by the patients before the removal of the gall stones, by forcibly injecting into the gall bladder, through the drainage opening, nothing but sterile salt solution.

Next to gall stones, adhesions probably play the most important causative factor in producing biliary colic.

Adhesions represent Nature's attempt to limit the effects of bacterial toxins or the spread of an attenuated germ infection. Active germ infection does not produce adhesions, the process is too acute for that; it produces death and necrosis of tissues—pus and sloughs.

We find that the adhesions which are formed about the gall bladder and ducts are thicker and stronger about the former and shade off as we approach the latter. This indicates that the causative factor radiates from the gall bladder as a focus. The fact that the gall bladder is frequently a storehouse of infection, especially the colon or typhoid bacillus, has been fully demonstrated. Williams (*N. Y. Med Jour.*, May 13, 1911). That such infection is the cause of biliary calculi is too well known to require proof. In order to produce gall stones the infection

must be in a very attenuated or weakened state. All writers are agreed that this thick, "tarry" condition of the bile is probably a preliminary step in the formations of such concretions. Richardson (*Bost. Med. and Surg. Jour.*, Vol. 156, 1907, p. 687), Cheyne and Burghardt (Vol. VII, p. 126). This being the case, this thick bile must contain purulent organisms in a state of great dilution or attenuation. This thickened bile cannot flow in an easy normal manner from the gall bladder, it is dammed back, there is an increase in the tension of the fluid within the gall bladder which results in causing a seepage of the toxins or even aids a migration of bacteria from the gall bladder. Either or both of these conditions will excite a plastic peritonitis about the organ by which it becomes glued to the adjacent viscera at once and later connected to them by bands of firm adhesions.

Bacterial infection also explains the production of cicatricial patches and strictures in the gall bladder and ducts, also the enlargement of the lymph nodes and the inflammatory changes in the pancreas.

FREQUENCY.

I can only offer tentative guesses as to the prevalence of non-calculus biliary colic. The statements in the literature are so indefinite or incomplete that they are almost useless for this purpose.

Davis (*Jour. Am. Med. Assn.*, January 13, 1912, p. 136) states that "of 234 gall bladders, 150 contained stones and 84 were cases of cholecystitis acute or chronic without stones." As he does not specify how many were acute or chronic we can draw no conclusions for our purpose.

Stanton (*Jour. Am. Med. Assn.*, August 5, 1911, p. 44, and a personal communication) gives us a little more definite information. In a total of 350 cases operated upon for gall bladder disease, no calculi were found in 105 cases. Excluding from this number cases evidently not belonging to our classification, we find:

- 3 of "tarry"bile.
- 10 of sandy bile.
- 14 of cholecystitis with adhesions.
- 3 with chronic pancreatitis, and
- 6 with adhesions to gall bladder or ducts but no other evidences of cholecystitis.

A total of 36 cases, constituting, roughly, 10 per cent. of the entire number. I feel, however, that 5 to 7 per cent. would be nearer correct.

SYMPTOMATOLOGY.

This will be best developed by the recital of some typical cases.

First. A case in which "nothing was found." Richardson (*ibid*) reports a case of a man "48 years old, who for the past two or three years had complained of pain in the upper right quadrant of his abdomen, which had gradually increased in severity. The last attack was sud-

den, severe, sharp, stabbing pain in the exact region of the gall bladder, radiating to the back and right shoulder. The gall bladder was palpable. At the operation the gall bladder was found soft, containing no stones, apparently perfectly normal. It was not opened. The patient made a perfect recovery and has been well ever since."

As the structures of the biliary apparatus were perfectly normal we must conclude that the condition of colic must have been due to a kinking of the duct, or still more probable, an altered state of the bile. This caused a distention of the gall bladder that was perceptible before the operation. Probably the manipulation at the operation emptied the gall bladder and only normal bile occupied it afterwards.

Second. Adhesions, but without change in the bile to account for the symptoms.

Johnson (*Surgical Diagnosis*, Vol. II, p. 168) gives this account of a "man of 56 who had had sharp attacks of gastric dyspepsia in the past. Three months before he had a typical attack of gall stone colic. Since then there were frequent attacks of pain referred to the umbilicus. There was no jaundice. When admitted to the hospital he had pain, vomited; temperature 101, pulse 90. Slight leucocytosis. There was a tenderness and rigidity in the upper right quadrant of the abdomen. The liver was normal in size. The gall bladder was not palpable. The diagnosis was made of gall stones and the operation performed for this condition disclosed the gall bladder buried in adhesions to the colon, liver and duodenum. The gall bladder was distended and tense, due to a sharp kink in the cystic duct caused by the adhesions. After these were separated the gall bladder emptied itself spontaneously and almost completely into the intestine. Examination of the excised gall bladder showed only chronic inflammatory changes in its walls."

Third. Adhesions about the gall bladder with thick, viscid bile, illustrated by the following case from my own practice:

Mrs. A. H., 33 years of age. Married, no children. Her history dates from the age of ten when she had an attack of "bilious fever," marked by headache and vomiting. She was in bed for some time. When thirteen she had a similar attack, only it was very much more severe. There was persistent nausea and some fever. There was no pain but a distress in the upper right part of the abdomen. She had a similar attack every winter until she was nineteen, when she had five attacks in that year. She was in bed from one to three weeks with each attack. She vomited a great deal and lost flesh rapidly during these attacks but regained it quickly after they were over. These attacks were not caused by anything she ate. They always came on when she was very tired and were almost always ushered in by an attack of sore throat that vanished when she began to vomit.

For two years she had fair health, then she had an attack of severe abdominal pain, called "intestinal grip" by her physician. She was sick for two weeks in bed.

Five years later she had an attack of grip with indigestion and pain all through her right side and under her shoulder blade, which lasted ten days. A few months later there was an attack of pain in the abdomen, pronounced by a doctor "neuralgia of the appendix." This pain increased in severity until it was felt all through the right side and under the shoulder. This confined her to bed for several days. From this time on there was more or less of this pain all the time, with more severe attacks brought on by great fatigue. These attacks seemed to be of two different kinds. In one the distress and pain seemed to be in the right side, back, and under her right shoulder. The other was in the abdomen, the pain coming like a colic from a point above the right hip through the body to a point below the umbilicus. This last was the most severe. She would scream with the pain and her clothes would be wet with perspiration. She was never jaundiced, never vomited or passed blood, never passed any stones.

Examination—Short, plump, very fair-skinned woman, good color. Thorax negative. Nothing abnormal visible. There is distinct tenderness over the region of the gall bladder. With the fingers pressed deeply beneath the costal arch and the patient directed to inspire deeply, there is a sudden arrest of the act with complaint of pain beneath the fingers. There is some, but less, tenderness over McBurney's point. The pelvic condition is negative.

Diagnosis—Gall stones and a kinked appendix.

Operation—June 10, 1910. Vertical incision through the outer part of the right rectus. The liver was congested and enlarged, its entire upper surface united to the diaphragm by filmy adhesions. The gall bladder was buried in adhesions which extended down the right side into the pelvis. The adhesions about the gall bladder were separated and it was found that they extended to the cystic duct. The gall bladder was opened but contained only thick, "tarry" bile. There was no sand nor was the mucous membrane altered. The cystic and common ducts were carefully explored; they were empty and normal. There were some enlarged lymph nodes along the course of the common duct. The pancreas seemed perfectly normal.

The gall bladder was drained in the usual way, with a tube wrapped in a few turns of gauze and covered with rubber tissue. It was surrounded by three flat, one-inch wide wicks of rubber tissue.

The appendix, two inches long, the end clubbed, the proximal and distal portion atrophied, was removed and its stump buried by a purse-string suture.

The abdominal wound was closed around the drains. Normal bile began to flow at the close of the operation and was caught in a bottle included in the dressings.

Convalescence was uneventful. The tissue drains were removed in the first week and the tube in the second. Bile ceased to flow by the third week.

Post-operative Course—For some months she had headaches that compelled her to go to bed. These gradually ceased with the great improvement in her general health. There has been no pain in the old regions. Three months after the operation she traveled over 8,000 miles and was not sick at all, whereas before the operation she could not go 50 miles without having an attack.

Fourth. When the cause seems to be located in the pancreas.

Deaver (*Annals of Surgery*, Vol. 49, p. 843) mentions four instances of non-calculus cholecystitis, two associated with chronic interstitial pancreatitis (determined by palpation). The salient symptoms in all were indigestion, epigastric heaviness and distress, gastric tympany, belching, meteorism and constipation.

Richardson briefly reports another case of a woman, 50 years of age, who had symptoms of gall stones upon whom he operated and found none. The head of the pancreas was thickened. She was entirely cured by the operation.

Fifth. The condition described by Moynihan (*Annals of Surgery*, Vol. 50, p. 1265) in which he found thick, "tarry" bile, and, in addition, the mucous membrane of the gall bladder studded over with minute sandy grains, so firmly imbedded in the tissue that they could not be removed by brushing or scraping. These cases were attended by symptoms of indigestion which always had lasted for months, sometimes for years. There was discomfort, a sense of weight, fullness or distension after meals, heartburn and acidity. At intervals attacks of pain occurred which were usually severe and sometimes agonizing. "Shivering" might accompany these attacks.

Summary—It is practically impossible to construct a symptomatology by which we can differentiate a calculus from a non-calculous biliary colic.

I think, however, that one striking feature that stands out above all others is that patients suffering from the latter form of biliary colic can have so many attacks without any very serious results. Of course we know that patients with gall stones often endure many attacks, but on the average, it will take a great many more attacks of colic without gall stones to drive the sufferer to seek surgical relief than where the calculi are the cause of the colics.

Further, one is impressed with the general appearance of well being of these patients. They do not look as sick as we would expect to find

them, judged from the duration and their account of the severity of their symptoms.

Fatigue seems to be an important factor in bringing on an attack of colic. The indigestion seems to have no certain reference to the food eaten, or to the time of the meals. Jaundice is not present, or very mild and transient. The urine and feces will show no bile. The temperature, pulse and respiration are normal. There are no blood changes unless an acute attack with infection supervenes.

Treatment—Medical. In the light of the causative factors the only successful medical treatment must be in the nature of prophylaxis. In the early stages of intestinal disorders we might possibly prevent many of the sequellæ of bacterial infection could we inhibit the activity of the bacteria themselves.

Mosse (*Therapie der Gegenwart*, Berlin, December, 1911) claims there is a group of cases in which the gall stone trouble can be cured by stimulating the secretion of bile, and for this he thinks nothing surpasses a mixture of 10 or 15 gm. of medicinal soap with mucilage of acacia q. s. to make 60 pills; three pills to be taken daily. This soap treatment was introduced by Senator, and some experiments reported from Pawlow's clinic confirm, Mosse says, this cholagogue action of soap.

Surgical. The condition once established there is no curative treatment except by surgical intervention.

In general we agree with Moynihan that the "sand-paper" form of gall bladder disease requires a total excision of the viscus. Simple drainage combined with thorough division of all adhesions and removal of enlarged lymph nodes will probably effect a cure for most of the other varieties.

However, if we consider the poor results of drainage in the cases reported by Stanton, from Ochsner's and his own clinic, we are inclined to advocate more radical measures.

Stanton concludes that "operations for cholecystitis without stones have not shown better results than could probably have been secured by medical means, and unless better results are obtained in this class of cases in the future, surgeons should learn to avoid them."

I do not agree with his conclusions. The condition is surgical and will yield to surgical measures. I believe that the reason why so many of this class of cases do not fully recover is that the cause of the disease—the infection—is not removed.

Infection of bile eventually produces calculi. Calculi are, then, the terminal results of this infection. The *function* of *gall stones* is to sequestrate, isolate the infecting organism. Calculi once removed by a simple cholecystostomy almost never recur. The reason is that with their removal you have also removed the infection.

Turbid, viscid, "tarry" bile and adhesions mark

the early stage of infection. These inevitably interfere with free drainage by the ducts and produce symptoms. Drainage of the gall bladder at this time may or may not remove all of the infection. If all the infection is removed and its secondary results in the shape of duct obstruction relieved a cure results. If this is not accomplished the disease resumes its manifestations soon after the wound of drainage closes.

To secure a cure in these cases I think we must perform a cholecystectomy. My contention is further borne out by the cases reported by Davis. While his statements are not restricted to the non-calculus type, still they are very instructive. He states that of 176 cases of primary drainage eleven were such sufferers as to consent to having a second operation performed. In 10 a cholecystectomy gave relief. One did not seem bad enough for this and a drainage operation was done. The relief was only partial.

When to do drainage and when to perform a radical excision in this type of disease I cannot attempt to say. Our data are too meager, but I feel that with thickened bladder walls, kinked duct and dense adhesions, with "tarry" bile present and normal bile not flowing freely at once, we should remove the gall bladder and effectually prevent a return of the symptoms.

In reference to the adhesions which bear so important a part in this and other abdominal conditions, I wish to state the following conclusions:

Adhesions represent the reaction of the peritoneum to irritation or very mild infection.

As long as the source of the infection is present these adhesions will gradually increase in extent and density.

Adhesions of the most extensive sort, found at one operation, have completely disappeared at a later operation.

The essential factor in the prevention and cure of adhesions is the removal of the infection.

The "use of aristol, caryle membrane (ox peritoneum), sterile oil or other substance applied locally, have not proved of value." Oviatt (Bryant and Buck, Vol. II, p. 726.) They are therefore worse than useless.

When operating in the presence of extensive adhesions, it is sufficient to remove the focus of infection, completely sever all adhesions, so far as possible invert and cover over all raw surfaces, but *nothing* will be *gained* by the introduction of any foreign material or substance or gas to prevent the reformation of adhesions. Some will inevitably form again, but with the removal of the infection these stand a fair chance of later being absorbed.

Discussion.

DR. JOSEPH D. BRYANT, New York City: I wish to congratulate Dr. Deaver, not only because of his excellent paper, but because of

his great work in surgery. He not only does this work, but he does it openly, distinctly, and with emphasis. Inasmuch as bile and the arrest of bile and the infection of bile each has to do with the development of gall stones, it is fitting to begin the study of the disease where the disease itself commences, namely, in connection with the mucous membrane lining the biliary tract. This membrane is liable to the same actions as characterize similar membranes elsewhere, and the inflammation may be either general or circumscribed in character. Bile collections, however, are not apt to occur in the former, but they will likely happen in the latter for obvious reasons. Pathologic conditions that involve a change in the outline of the duct and give rise to disease should be detected and removed, or soon there will be a return of the diseased condition. A return, however is not likely if proper care has been taken to remove exciting causes of diseased action. One should remember, however, that the common duct gradually narrows from its beginning, downward to the end. When distended by injection on the cadaver, the first portion of the duct is from 7 to 8 mm. in diameter, the second substantially 5 mm., and the third from 3½ to 4 mm. The papillary orifice itself, however, is 2½ mm., sometimes 3 mm. It can thus be seen how slight deviations from any cause in connection with the common duct related to its lumen, its walls, or to contiguous structures may promptly interfere with the proper discharge of bile, even causing complete occlusion.

There is no doubt about the importance of infection in this connection, which infection gains admission through the portal system or by way of the duodenum, possibly through other channels of less practical importance. Running along the common duct there are lymphatics with their lymph nodes, either of which by distortion or enlargement may interfere with the caliber of the duct. These enlarged glands if undisturbed at operation may give rise to continued obstruction or become the basis of another, more or less formidable in character. I believe in promptness in operative activity. Drainage should be thorough and be maintained until the absence of infection is assured. Hysterical manifestations not infrequently simulate gall colic. I have in mind a patient now, who suffered from attacks simulating those dependent on gall stone, who, however, was promptly relieved by a journey from the city and not attacked while out of town. Responsibilities and contentions related to business induced these attacks, which disappeared at once along with the tribulation that begot them.

DR. EDWIN M. STANTON, Schenectady: These are two valuable papers, and Dr. Bryant's discussion was likewise valuable. I

concur with Dr. Bryant concerning the relation of obstruction to infection. This has been my observation both in the laboratory and clinics. As long as the operation secures free drainage the cases are cured, but if there is a recurrence of obstruction we have reinfection. The older surgeons recognize the great possibilities in the surgery of the biliary tract, but the final standing of gall bladder surgery depends upon whether we make good by a low mortality and good end results in these operations. The mortality is not numerically high, and the end results in competent hands are as good as can be expected.

I had intended to show statistics in this state to prove the above statement, but I am not able to do so. Instead I find that the operative mortality as published from 25 representative hospitals of this state in 1910-1911 averaged 8.3 per cent. We can and should reduce this operative mortality by about one-half. It has usually been said that about one in ten of adults over thirty years of age have gall bladder disease. Of 702 adults coming to autopsy in Albany, 81 were found to have gall stones, and this gives an idea of the possibilities in this line of surgery, provided the average surgeon of this Society can show a reasonably low death rate. There could be nothing better than the appointment of a commission by the Surgical Section of this Society to investigate the mortality from gall bladder operations in this state. We would then be in a position to lay the blame to medical delay or to the surgeon and I am sure that the surgeons could learn to reduce their mortality to a point where gall bladder surgery would become justly popular with the medical side of our profession and with the public.

DR. CHARLES G. McMULLEN, Schenectady: These cases are not attended by satisfactory results; not more than fifty per cent. are cured. They need more careful diagnosis. In cases not really cholecystitis they need some more efficient form of treatment. We can accomplish our object better by a cholecystenterostomy than by a cholecystectomy.

DR. I. S. HAYNES (closing): The point is well taken by the speaker, but I still favor cholecystectomy because by other methods adhesions are formed which later have to be attended to.

AN OPERATION FOR POTT'S DISEASE OF THE SPINE.*

By RUSSELL A. HIBBS, M.D.,
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IN the *New York Medical Journal*, May 27, 1911, I published a preliminary report of three cases of Pott's disease of the spine, which had been subjected to an operation for

the purpose of producing a fusion of the posterior aspects of the vertebræ, to obliterate motion of the vertebral articulations over the diseased area and to relieve pressure on the involved bodies, thereby hastening the cure of the disease and preventing deformity.

In the *Annals of Surgery* for May, 1912, a further report was made on these three cases, in all of which a sufficient length of time had elapsed to demonstrate the functional sufficiency of the new and continuous bone splint covering the affected area. They had all been without external support long enough to justify the conviction that not only fusion had taken place, but that motion of the vertebral articulations had been eliminated over the operative field, the progress of the deformity and the activity of the disease arrested.

In my preliminary report published under date of May 27, 1911, I suggested that in very young children it might be necessary to graft bone from the leg. This feature of the technique has been practiced by Dr. F. H. Albee, who reports in the *Journal of the American Medical Association*, September 9, 1911, three cases. The first operation having been done June 9th.

Dr. Royal Whitman reports a case in the *Annals of Surgery* for December, 1911, operated upon August 11, 1911.

I have not practiced this feature of the technique, because I have not thus far found it necessary, even in cases as young as two and a half years of age.

This operation was suggested to me by my experience in the use of an operation involving practically the same principles, for stiffening the knee joint by mortising the patella into the joint after it was denuded of periosteum.¹ The patella periosteum was carefully preserved and sutured to the periosteum of the femur above and to that of the tibia below. In these cases continuous bone was produced between the femur and the tibia, obliterating the joint.

I thought that in the spine the careful removal of the periosteum of the spinous processes and the laminæ, with the spinous processes transposed to bridge the gap between the vertebræ, would lead to formation of bone, fusing the vertebræ and eliminating motion between them.

It is important to observe that in the case of the spine the gap to be bridged between the laminæ and the spinous processes of any two adjacent vertebræ is very narrow. Figure 1 is a photograph of a dried preparation of the vertebral column and ligaments, and shows the narrow gaps very plainly.

In performing the operation a longitudinal incision is made directly over the spinous processes, through skin, supra-spinous ligament and periosteum, to the tips of the spinous processes. The periosteum is split over both the upper and lower borders of the spinous processes and the laminæ and stripped from them to the base of the transverse processes.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.



FIG. 1.—From a photograph of a dried specimen of the spinal column and ligaments, showing the narrow gaps to be bridged between any two adjacent vertebrae.

Figure 2 is a drawing made from a dissection which shows the periosteum retracted and the spinous processes transposed, and also a bone bridge made across the space between the laminae.

Figure 3 is a lateral view of the transposed spinous processes.

The lateral walls of periosteum and of the split supra-spinous ligament are brought together over these processes by interrupted chromic catgut sutures. The skin wound is closed by silk,



FIG. 2.—1, shows periosteum sutured; 2, half of supraspinous ligament; 3, space between the adjacent edges of the laminae; 4, a spinous process transposed by partial fracture, making contact with its own base and the tip with the unbroken spinous process below it; 5, a spinous process marking the upper end of bridge; 4 to 5, transposed spinous processes; 6, space between periosteum when removed from spinous processes and laminae as it appears before suture; 7, periosteum from spinous processes and laminae; 8, a small strip of bone elevated from the laminae placed transversely across gap, its free end making contact with the laminae adjacent; 9, spinous process unbroken, marking the lower end of the bridge.

and a steel brace applied, with the space between the uprights increased somewhat at the site of the wound so as not to make pressure upon it.

Rest in bed is absolute for from eight to ten weeks. During the next four weeks sitting up is permitted. At the end of the twelfth week walking is allowed.

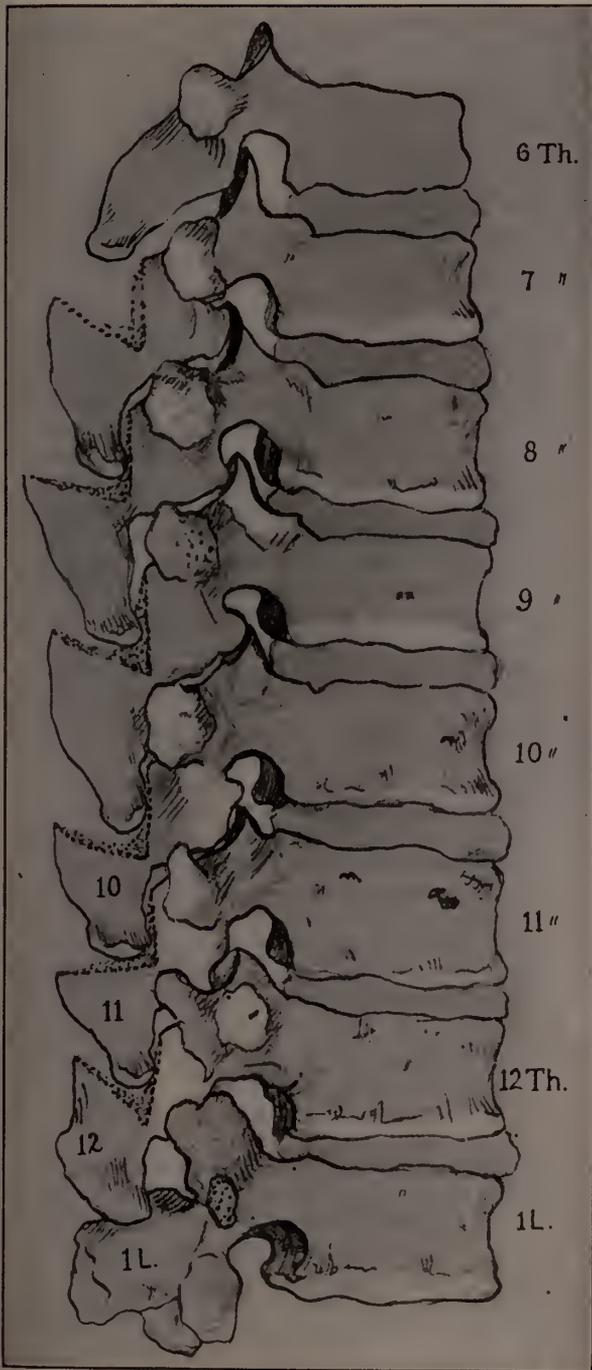


FIG. 3.—Spinous processes partially fractured and used for bridging the gap between the vertebrae.

The brace is continued for another month, when it is removed for a part of each day until gradually left off entirely; with children under five it should be worn for six months.

The reduction of the deformity in some cases by the operation has been conspicuous, especially in adults, with disease in the lower dorsal region. If the operation accomplishes what it promises, it should be done early before deformity develops.

The number of vertebrae in each instance included in the operation is determined by the extent of the disease. It is necessary always to be sure of attaching the diseased vertebrae at either end of the involved area to healthy ones above and below. The extent of the disease may be determined accurately in some cases by X-ray pictures. When this is not possible, the only guide is the kyphos or the region of rigidity.

It is a fact that all the vertebrae involved in the kyphos are not diseased and that inaccuracy in the number of vertebrae to be operated on is possible. But care should be taken to include a sufficient number, as otherwise the elimination of motion of the diseased joints will not be obtained.

The error of not including a sufficient number of vertebrae was made in one case, a boy of five years of age, operated upon August 23, 1911. This boy had active dorsal disease with a marked kyphos, and his operation included the seventh to the tenth dorsal vertebrae. He did not show the relief that all the rest of the cases had shown and on February 20, 1912, he was operated upon a second time, and the condition found was interesting and of very great importance. There was a continuous bone formation extending in length from the seventh to the tenth dorsal vertebrae, the extent of the first operation, and in width from the transverse processes on one side to those of the other.

This bone bridge was not disturbed, it was only extended by anchoring the fifth and sixth dorsal vertebrae to it above, and the eleventh and twelfth below.

There are two considerations in connection with this case that are of very great importance. First, that in this child of five, there had taken place throughout the operative field extraordinary bone growth sufficient to produce a fusion of the posterior aspect of the vertebrae, and second, that error in the number of vertebrae included was made.

The stiffening of a small segment of the spine in a given case is not a serious matter in view of the fact that the remaining healthy joints compensate for the loss of function of the few. Indeed is it not a fact that comparatively few cases of Pott's disease recover with movable joints?

A striking illustration of this, was Case 3, previously reported, a woman of twenty-five. While six vertebrae were included in the operation, thus stiffening a long segment of her spine, the spine above and below the field of operation allows such freedom of motion that she shows almost no awkwardness.

In the first few cases, no attempt was made to close the narrow gaps in the periosteum laterally, as is shown in Figure 2. In many cases since, I have closed these gaps, thus establishing at once, continuous periosteum on either side which is sutured together in the middle.

The small space between the laminae bridged by elevating a small piece of bone from the edge

of the laminae (see Figure 2), and placing it transversely across, its free end in contact with the laminae next below, with the gap between the spinous processes filled by their transposition, makes me doubt the necessity of thus suturing the periosteum, as I think bone becomes continuous and that a fusion takes place of the vertebrae operated on. Certainly positive proof of this fact was given by the result seen in the case operated upon the second time, referred to above.

It is important that the periosteum from the adjacent edges of the laminae, be pushed back to their ventral sides after its removal from their posterior surfaces, so that the piece of bone elevated from the edge of the laminae, used to bridge the gap between them, may be altogether free from periosteum. The establishment of this bone bridge is an important part of the technique and its practice not difficult.

It has long been the accepted theory that the osteoblast was generated from the periosteum and for that reason, great care has been exercised to remove it without injury. However, MacEwen's² experimental studies of bone growth seem to prove that the osteoblast emanates from the bone. Whether it is generated from periosteum or from bone, is a question which need not be determined in estimating the value of the surgical procedure under discussion.

We have both structures here in abundance, the operation stimulates the generation of the osteoblast, provides a place for its deposit and nutrition between the periosteum and bone, insures its continuous formation along the posterior aspect of the vertebrae operated and produces fusion of laminae and spinous processes from the transverse processes of one to those of the other side, thus giving a perfectly symmetrical, extensive and adequate support.

My experience of the beneficial effects of immobilization, even when imperfectly obtained by braces and jackets, on tubercular disease of vertebral and other articulations, justifies me in believing that a more perfect degree of such immobilization, produced by bony anchorage of the diseased structures in the desired position, will unquestionably be of the greatest help in arresting and controlling the morbid processes, and will eventually lead to a radical cure of the disease.

I have felt justified in continuing this work and have operated on forty-three cases at the New York Orthopaedic Hospital. Twenty-five in the dorsal, five in the lumbar and thirteen in the dorsolumbar region.

Twenty-six were from two and a half to ten, fourteen from ten to fifteen, one eighteen, one twenty-five and one forty-one years of age. The duration of the disease has varied from three months to ten years, in the large percentage, under five.

In all, the wounds have healed without complication, pain has been slight and there has

been no reaction from the operation. Eighteen of the cases have been without support for from three to twelve months and have shown no symptoms of disease or any increase of deformity.

While it is too early to make a final report on these cases, one other observation has been made in connection with this operative experience, which is of very significant importance. The fact that in nine cases, or over 20 per cent., a fusion of the laminae and the spinous processes of two or more vertebrae involved in the kyphos, was found.

Eight of these cases were under ten years of age, one being only two and a half and one sixteen at the time of operation. The duration of the disease in one was four months, the case of the two and a half year old, in one two years, in six under four years and in one ten years.

In all nine cases the fusion was of vertebrae in the lower segment of the kyphos, in two, of three vertebrae, and in seven of two vertebrae, but in none was the fusion complete in producing anchorage of the diseased vertebrae to healthy ones below and above.

This attempt on the part of nature to eliminate motion of these diseased joints by extraordinary bone growth, though it was incomplete, is very important, as it indicates the principles which should guide the surgeon in attempting to produce this result by operation, and suggests that the procedure herein described, which preserves all the structures essential to the development of bone and stimulates their activity, is consistent with those principles.

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THE SURGICAL TREATMENT OF IRREDUCIBLE DISLOCATIONS OF THE SHOULDER AND ELBOW JOINTS.*

By LUCIUS W. HOTCHKISS, M.D.,
NEW YORK CITY.

ARTICULAR surgery, as applied to the relief of old irreducible dislocations of the larger joints, only became a possibility after the introduction of the antiseptic wound treatment of Lister, and its development corresponds closely with that of the modern aseptic surgical technic. From the first successful case of tenotomy of the tendon of the pectoralis major, performed by Weinholt in 1819, in the reduction of an old dislocation of the shoulder, to the operations of the present day, the history of arthrotomy affords a fascinating record of progress and achieve-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

ment, in a class of cases long held to be beyond the range of surgery. The first successful case in America of arthrotomy for dislocation of the elbow, was reported by Warren of Boston in 1869, and later, numerous cases here and abroad were reported by Langenbeck, von Lesser, von Wahl, Ollier, Hamilton, and many others. In 1892, Stimson published his studies of the anatomy of old elbow luxations and demonstrated clearly the feasibility of reducing them after an arthrotomy with division of restricting bands and generally without joint resection or a preliminary division of the olecranon.

Stimson's work made clear many points in the pathology of old elbow dislocations which had not been hitherto understood; and in addition to clearing up the diagnosis, placed the treatment by open arthrotomy with reduction, upon a rational basis.

Although we speak of these irreducible luxations as "old" or "ancient," it must be remembered that a considerable number of these cases are irreducible primarily, and so may be neither old nor ancient.

There are, therefore, two great groups of cases to be considered:

First, those which for various causes are irreducible from their inception, and second, those which though primarily reducible, have become irreducible through the lapse of time and the growth of adhesions.

In the first group, the conditions which may prevent primary reduction are numerous and variable. Thus the head of a displaced radius may be thrust through an overlying muscle and so firmly gripped as to be irreplaceable without excision of the head of the bone, as happened in one of my own cases. Or the head of the humerus may be restrained by an interposed tendon or muscle, from being returned to its proper place without division of the restraining bands in question.

Or there may be a complicating fracture of the head or neck or process of the bone which by its displacement renders reduction difficult or impossible without resection.

In the second, and by far the more numerous group, the growth of adhesions, the contraction of the aperture in the torn capsule, the contraction and adhesions and atrophy of the surrounding muscles and soft parts secondary to the trauma and to the pressure upon important nerve trunks, the adhesions of important blood vessels to the torn capsule of the injured joint, all tend to make reduction by manipulation not only difficult or impossible but extremely dangerous.

The possibility of causing a fracture of the humerus in elderly people by forcible attempts at reduction of an old shoulder luxation constitutes a real danger, which is not always heeded; and the possibility of rupture of an important nerve or vessel from the heel in the axilla or from over forcible manipulations in these old

cases, is ever present, and cases of this sort do not all belong by any means to prehistoric times.

It will be evident, then, inasmuch as the exact conditions existing in any given case of old irreducible luxation of an important joint can only be ascertained by a direct inspection through an open incision, viz., an arthrotomy, that such an operation is a rational procedure.

The only other questions to be answered, then, are, is there such an operation? is it effectual? and to both of these, I think, an affirmative answer may be returned. A large number of cases has been reported and the results are generally satisfactory. The mortality of the operation, according to Dollinger, who has collected a large number of records of his own and from other sources, is about 2 per cent., *i. e.*, about the same as the mortality from dislocations of joints of the upper extremity which have been unoperated. This low mortality rate seems surprising in view of the severity of the operative procedure in some cases, and speaks volumes for the reliability of modern surgical methods.

In this brief paper, which is purely practical and based largely upon the personal results obtained in the operative treatment of 15 cases of old dislocation of the shoulder and elbow joint, the writer has confined his attention to these two articulations because the conditions in question are perhaps most often observed therein. Of course, similar operative treatment is equally applicable to the other large joints.

My personal records of arthrotomy for old irreducible dislocations of the shoulder and elbow, include 15 cases, of which 8 were of the shoulder and 7 of the elbow.

In these 15 operated cases, there was no mortality.

The ages of the patients varied between 7 and 60, and in all save one, in which the record is incomplete, the functional results were good. One must always expect, perhaps, some stiffness following an arthrotomy at the shoulder with division of extensive adhesions and replacement of the bone to its normal position. This is generally more than compensated for, however, by the movable scapula; while the restoration of the rotundity of the shoulder and the absolute relief of pain, in cases where this was a marked feature, give much satisfaction and relief to the patient.

As a rule the diagnosis is easy in the old shoulder dislocations and may often be made by inspection alone, so characteristic is the deformity in some cases. An X-ray plate, however, clears up many unsuspected conditions, and is most useful both as a guide and as a record. In the old backward dislocations of the elbow, on the other hand, the differential diagnosis between it and fracture of the condyle, is by no means always clear and here the X-ray is especially valuable and necessary.

As to the operation itself, arthrotomy consists

essentially in an incision made into the affected joint for the purpose of determining what had best be done with that joint. The further procedures consist in the division of adhesions, the careful conservation of certain tendons and the nerve and vascular trunks, and in the reduction of the joint surfaces to their normal positions, or, if this be not practical, in the performing of an excision of bone as the best means of securing the best results. It is evident, then, that as much depends upon the judgment of the surgeon in these cases as upon his operative skill, to solve the problems which may suddenly present themselves. As in all my cases of unreduced dislocation of the shoulder the head of the humerus was displaced anteriorly, I have had only experience with the anterior incisions, viz., that of Andrews dividing the fibers of the pectoralis major directly across and resuturing the same at the end of the operation, and with the older incision, which runs along the upper humerus between the borders of the deltoid and the pectoralis major. With the axillary incision, which is said to give an admirable exposure of the field, I have had no experience. With the incision of Andrews I have been well satisfied, as it gives a wide and direct exposure of the field of operation and gives a better approach than the longitudinal incision in these particular cases.

Although an arthrotomy for the reduction of an old dislocation of the shoulder appears a somewhat formidable procedure, it is not, in my experience, as difficult as an arthrotomy at the elbow for the reposition of both bones backward. In this latter form of luxation, of which there were four in my series of cases, the approach to the joint is best made by the method of Stimson or through the antero lateral incision described by Kocher. Although some of the forward and partial dislocations may be dealt with through other incisions, the method of Stimson, if carefully followed, best enables one to open the elbow joint, clean out the olecranon fossa, chisel off the new growth of bone caused by the tearing up of the periosteum above the internal condyle of the humerus and to deal with the various constricting bands and adhesions with the least danger to the integrity of important structures about the joint. For a full description of the incisions and the methods of dealing with the conditions found, those who are interested are referred to the original article of L. A. Stimson on this subject. My first case of arthrotomy in an old unrecognized and unreduced dislocation of the elbow in a man of over 50 was operated upon by the method in Bellevue Hospital in 1892, shortly after the publication of Stimson's paper, which had been the inspiration of my first work. In the case of old unreduced elbows the older surgeons generally preferred excision of the joint. This operation indeed is much easier and much more quickly done, but a *reductio ad in-*

tegrum, after a careful arthrotomy gives results which, I think, are superior as to strength and utility.

To this very brief description of the possibilities and scope of a carefully planned arthrotomy in old unreduced dislocations of the joints of the upper extremity, I append the abbreviated histories of my individual cases.

HISTORIES. I. ELBOW.

No. 1.—Backward dislocation of both bones of the forearm. Unreduced elbow had been put up in full extension and patient was helpless as regards use of joint. Duration, several weeks. Operation, Bellevue Hospital, 1892. Arthrotomy, Stimson's incision, cleaning out of olecranon fossa, etc.; reduction, closure with drainage. Result, good function, strong power of extension, free flexion, but considerable lateral mobility which did not interfere much with usefulness.

No. 2.—Child, female, age 9. Backward dislocation of both bones of the forearm. Arthrotomy, reduction, Hood Wright Hospital, July, 1895. Dislocation five weeks old. Posterior incision, division of restricting bands, reduction. Good functions and motion. Reported N. Y. Surgical Soc. *Trans. Annals of Surgery*, Vol. 22, p. 798.

No. 3.—Child, female. Outward dislocation at elbow. Arthrotomy, reduction, Hood Wright Hospital, February, 1901. Good functional result.

No. 4.—Male, adult. Exploratory arthrotomy, irreducible dislocation of elbow, Hood Wright Hospital, February, 1902. Result not known. History lost.

No. 5.—Irreducible forward dislocation head of the radius. Male, 24, Roosevelt Hospital, May 18, 1905. Excision of head of radius which was thrust through the overlying muscle; orbicular ligament torn. Good function.

No. 6.—Old backward dislocation both bones of forearm at elbow. Adult, male. Arthrotomy, reduction. Difficult. Had been treated as fracture and put up in full extension. Reduction perfect; good function; some stiffness yielding to massage; functional result excellent. Operation at Roosevelt Hospital, February 4, 1909.

No. 7.—Boy, age 7. Roosevelt Hospital, October 6, 1909. Anterior dislocation elbow, both bones forward; complication, fracture external epicondyle and capitellum fractured. Replaced without suture; dislocation reduced; short operation. Good function.

II. SHOULDER CASES.

No. 1.—Old subcoracoid, irreducible by manipulation. Arthrotomy, reduction. Good function. Adult, male, Hood Wright Hospital, October, 1898.

No. 2.—July 28, 1903, Roosevelt Hospital. Old subcoracoid, ten weeks. Difficult arthrotomy. Division long head of biceps and external

rotators. Posterior edge head of scapula splintered. Male, 28. Good function. Seen one year later. Abduction limited, function good.

No. 3.—Old subcoracoid, very painful from pressure on nerves; one year from date of injury. Arthrotomy reduction. Relief of pain; good function. Adult, female. Roosevelt Hospital, September 2, 1903. Reported to Surgical Society.

No. 4.—Old subcoracoid. Bellevue Hospital, May 27, 1905. Male, 50. Arthrotomy. Reduced after very extensive division of adhesions. Excision of humeral head below tuberosity, which showed evidence of old fracture. Good function; useful arm; resumed work.

No. 5.—Bellevue Hospital, January 31, 1908. Old subcoracoid. Male, 60. Andrews' incision. Arthrotomy, reduction difficult and after wide division. Resection head of humerus. Good function.

No. 6.—Old injury, dislocation complicated with comminuted fracture of head of humerus; dense adhesions; excision of the head of the humerus. Andrews' incision. Good result. Female. Bellevue Hospital, January 31, 1908.

No. 7.—Old subcoracoid. Bellevue Hospital, April 9, 1910. Adult, male. Arthrotomy, Andrews' incision. Reduction; subscapular muscle divided and resutured with capsule. Good function.

No. 8.—Old subcoracoid. Bellevue Hospital, June 6, 1911. Arthrotomy, reduction. Good result.

THE TREATMENT OF SIMPLE FRACTURES BY THE CLOSED METHOD.*

By JAMES MORLEY HITZROT, M.D.,
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IN seeking a method for the treatment of any given surgical condition, that which offers the most to the patient with the least risk should be the method of election.

With the rapid increase in surgical knowledge and the more widely diffused experience in surgical procedures, in the abdomen, for example, the axiom has arisen, "When in doubt, operate"; and in the belly operation early is much safer than delay. Does this axiom of early operation as the method of election apply equally to the treatment of simple fractures, or, since the open method has been extensively practised, is the pendulum swinging back to the more conservative procedure?

The recent literature all tends to show that open operation is being relegated to the treatment of a very limited number of definitely selected cases and that any operation upon a fracture should be done by an experienced surgeon and by a surgeon whose experience has covered the whole field of the treatment of this form of

bone injury. The reason for this statement lies in the fact that as soon as more care was given to the mechanical details involved in the treatment of fractures, such improvement has occurred in the results obtained that the necessity for any operation has become less frequent.

The details of the treatment of simple fracture by non-operative methods, while by no means simple, offer no unsurmountable difficulties, and while reduction perhaps is not so completely accomplished as by operative means, it is far less dangerous. From numerous reports it has become more evident, as has been frequently pointed out by Stimson, that operation upon a simple fracture is pregnant with danger to the patient by reason of infection.

Roberts (*Annals of Surgery*, March, 1912), in the discussion of a paper read by Gibbons before the Philadelphia Academy of Surgery, stated that a large proportion of the operative cases have never been submitted to efficient non-operative treatment, and that he considered Dr. Gibbons right in stating that the great majority of fractures can be treated by non-operative means; and, furthermore, "when this (the non-operative method) is not successful, the failure is due either to the patient's own negligence or to a want of mechanical sense and attention on the part of the surgeon."

In a paper read before the New York Surgical Society (*Annals of Surgery*, March, 1912) the writer has analyzed the treatment of a group of fracture cases based upon the study of the end results.

Certain factors were impressed upon me while studying the cases used for that paper, namely, that the earlier reduction was attempted, the better that reduction; he more carefully the details of the treatment by traction were carried out, the better the result by that method.

Every fracture should be carefully examined as soon as it reaches surroundings which are suitable for the necessary attention to the details of treatment which that given fracture requires. If reduction of the fracture is impossible without an anæsthetic, anæsthesia should be used, unless there is some intercurrent condition which would render that procedure dangerous.

Certain types of fracture are particularly suitable for immediate reduction and fixation, of which one may mention Colles fracture, Potts fracture, fracture of both bones of the forearm and of the lower leg. Careful palpation will readily determine the position of the fragments and the line of fracture. By using the more superficial bone as a guide, one may determine fairly accurately the degree of reduction obtained—say, for example, by palpation of the tibial crest in the fractures involving that bone. Measurement of the affected and the unaffected sides will act as an aid in determining the relative length of the injured bone as compared to the normal.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

Where immediate reduction is possible and control palpation, measurement and the alignment of the injured limb as compared to the opposite side, are satisfactory, fixation should at once be applied.

Nothing so readily conforms to the ordinary demands for fixation as the moulded plaster splints introduced by Stimson. They are very simple to make, are easily moulded to the limb, rapidly harden, and during their application permit of examination of the superficial bone, so that one can readily tell just what degree of reduction has been maintained.

In robust, muscular individuals, in the extremes of age, and in certain general and local intercurrent conditions, immediate reduction may be impossible in the first instance or inadvisable in the latter two. In these, traction by some form of extension and fixation by virtue of this continuous traction becomes advisable.

Neither of these procedures, immediate reduction with fixation or reduction and fixation by continuous traction, can be properly carried out by anyone whose mental limitations do not enable him to appreciate the mechanical details involved. A five-pound weight will not move a twenty-pound limb, nor will traction in the displaced direction of the distal fragment overcome the angulation produced by flexion and abduction of the proximal fragment. The degrees of abduction and flexion which are necessary are problems of each individual fracture and for their proper application require the knowledge of certain definite but very simple mechanical details.

Every limb to which adhesive plaster is to be applied should be carefully shaved and wiped off with alcohol, the adhesive plaster applied and traction made in the proper degree of abduction, etc., by a weight sufficiently heavy for that particular case. What that sufficient weight is must be estimated by considering the inertia of the limb to be moved and the amount of weight above that necessary to tire the muscles and stretch them sufficiently to permit the broken ends of the bone to come into apposition.

It is the writer's belief that the more rapidly this is accomplished, the better. Therefore, sufficiently heavy weights should be applied early.

The result of such traction should be controlled by daily measurement, palpation, and adjustment of the alignment, and should not be continued after one week or ten days if the result of these daily examinations should show that the method in use is not producing the desired result.

Whether the fracture is immediately reduced and fixed, or whether traction is the method used, the resulting reduction should be controlled by the X-ray. No one should endeavor to treat any fracture by continuous traction who does not control his measurements, etc., by an X-ray picture with the traction apparatus and its accessories in action during the process of radio-

graphing the fractured area. It is the height of absurdity to use traction for a week or more and then to take off the weight, place the patient on a stretcher and cart him to the X-ray room. For even if the limb is splinted, it can give little or no idea as to the real value of the extension in question.

The writer prefers to have a plate made in two planes, stereoscopic if possible, to the use of the fluoroscope, because of the greater accuracy of the plate method.

If the measurements, palpation and the alignment are to all intents the same on both sides, too much stress must not be laid upon minor degrees of displacement as shown by the radiograph.

In fractures of the patella, in fractures of the olecranon with wide separation of the fragments, in articular fractures with displacement of the head, as, for example, fracture of the neck of the humerus or the neck of the radius with dislocation of the head, fractures of the carpal scaphoid with displacement of the proximal fragment, operation is clearly indicated since the resulting disturbances of function are much greater when the non-operative method is pursued.

The other types of articular fracture should be examined at the very earliest moment under an anæsthetic, reduced, fixed and an X-ray taken. A careful study of the facts thus obtained must be made and the pros and cons carefully considered before any operation should be attempted. No matter what the treatment may be, some disability is sure to follow. That form of treatment should be followed which offers the patient the least possible disability, and in the choice of the treatment to be used much judgment and a very large degree of experience is required.

Each case must be a law unto itself and the mechanical features of the individual case must be most carefully considered, for that method which will succeed in one type may fail most signally in the next.

Too much stress cannot be placed upon the proper after treatment of fractures. Massage should be begun as soon as the callus is solid enough and should be systematically carried out. It is difficult to formulate a definite rule for the time at which massage should be begun, but it is my practise to begin it not later than the end of the second week.

Baking, by the Bier method, should be begun as early as the second week, and hydrotherapy and electricity for the preservation of muscle tone and activity should not be neglected.

In general, the earlier active and passive motion is permitted within the limits of pain, the better the result.

In conclusion, one may safely say that the more carefully the details of reduction, fixation and after treatment are carried out, the better will be the result.

SYMPTOMATOLOGY OF HYPERTHYROIDISM.*

By GEORGE DOCK, M.D.

ST. LOUIS, MO.

THE word hyperthyroidism has in a comparatively short time largely displaced such terms as Graves' disease and exophthalmic goitre, and has been of value in leading us to think of a definite organ affection rather than a vague conception such as "neurosis," "blood disease" or "auto-intoxication." The usage has been strengthened by the results of surgical treatment, and, carried out by many skilful operators, often controlled by critical physicians, the operations now furnish so great an experimental material that we can exclude accident, coincidence and suggestion as seriously vitiating the results. Moreover, these results agree with those of grafting and feeding, and with those of over-use of thyroid substance, reported by many observers, by antithesis.

And still, useful as the term is, there seems to be danger of trusting too much to it, and of resting content in the belief that with a modern term we have a complete explanation of pathology.

When Moebius formulated the theory of hyperthyroidization twenty-five years ago, he was uncertain whether the process was an excess or a perversion of function, a hyper- or a dysthroidization.

An enormous amount of work has been done since then and many details have been added to our knowledge, but we shall do well if we continue for some time longer to approach the study of thyroid functions and symptoms with open and inquiring minds.

We are still uninformed regarding many details of thyroid function. When an author like Melchior denies the possibility of dysthyroidism, and quotes Hoenicke's cure of hypothyroidism by Basedowian thyroid as a proof, one can point to the possible fallacies in all limited therapeutic experiments.

Owing to the remarkable chemical discoveries made in the last twenty years in the thyroid, one may look forward to further elucidation of the subject by that means, but some of those who have examined most carefully are most cautious in expressing their belief.

Some of the chemical findings have apparently been too broadly applied. Thus Klose, working in Rehn's clinic, has made many experiments with the juice of thyroids from cases of exophthalmic goitre and simple goitre. Using the former in animals he gets the specific clinical picture of Basedow's disease, including the blood changes, but he has been led to conclude that exophthalmic goitre is an intoxication from inor-

ganic iodine; that the thyroid has two functions, taking iodine out of the body and warehousing it as iodothyronin. Such ideas, and all those based upon estimations of iodine in various thyroid glands, lose weight because we cannot tell in any case how fast the iodine is being absorbed, worked up and excreted. It is as if one studied the function of the liver by extracting bile salts or acids in livers removed at operations or post-mortem.

Our knowledge of the pathologic histology, extensive as it is, is not yet near the point of complete acceptance. In fact, to me, some of the lack of agreement seems strained. From Greenfield to the careful and comprehensive work of MacCallum, Wilson and Marine and Lenhart, all investigators have found changes indicative of hyperplasia, and in a majority of cases in such excess as to leave little doubt as to the possibility, at least, of hyperfunction. We may admit, with Marine and Lenhart the possibility of hyperfunction without anatomic changes in the parts examined, but from the rarity of this process too much stress must not be placed upon it. I think it even more important to remember that since the days of more accurate clinical observation more than half the thyroid gland is rarely removed by operation, and examined. Examination of a whole gland, post-mortem, is rare, and even if made suffers from the presence of alterations that may not have existed earlier in the disease.

In many cases, besides the regeneration of hyperplasia, we find various degenerative changes, and it is as unwarranted to think these are never associated with symptoms as it would be to think the hyperplasia always is.

So I have much sympathy with the view presented by your program—perverted function, rather than hyperfunction—and I think we shall do well if we seek for evidence of more than hyperthyroidism, both clinically and anatomically.

If there is a still more serious objection to the use of the term hyperthyroidization than those mentioned, I think it lies in the tendency to make us overlook the participation of other glands with internal secretions in all thyroid diseases. That other glands are affected in function in varying degrees, is a fact that must not be forgotten, but should act as a guide to the observations and explanations of symptoms, and it seems to me as the word hyperthyroidism spreads, the idea of association of ductless gland diseases becomes less prominent in medical literature.

Admitting the existence of hyperplasia as the essential anatomic feature in hyperthyroidism, the question presses for answer: Does this occur without previous damage to tissue or loss of function? We may believe the thyroid reacts very promptly to irritation, for we see it sometimes in operative traumatism, even in the non-Basedowian goitre, as observed by Tillaux in

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

1905, in iodine and thyroid medication and from other causes. But can we believe that in thyroiditis following or due to tuberculosis, tonsillitis, influenza, typhoid fever, staphylococcus infections and syphilis—all of them observed causes of hyperthyroidism—there is no primary destruction or degeneration of epithelial cells? MacCallum has expressed himself more clearly in favor of the occurrence of such changes than have most other investigators.

If we assume that degeneration of the thyroid may produce symptoms just as hyperplasias are assumed to, we have, of course, the duty of seeking for these symptoms. Although the study of typical or severe cases of disease may divert attention from milder cases, on the other hand severe or chronic cases may furnish a history of symptoms that may not have been observed when they occurred, and so direct the physician to look for them generally, or they may have occurred without other symptoms that might help to assign them their real cause.

In two cases of long-standing exophthalmic goitre, I was able to find records of an early and intense physical depression, from two to four years before hyperthyroidism could be made out. The tendency to fatigue was more constant and more intense than we often see it in neurasthenia and there were no other neurasthenic features. At the same time there was not the muscular weakness of some hyperthyroid cases, nor the paroxysmal asthenia of Addison's disease, nor any obvious explanation for pure myasthenia. This symptom gradually disappeared, the improvement not unnaturally attributed to the treatment carried out, but not including thyroid or iodine and then, after a considerable period, began the muscular weakness, emaciation, nervous irritability and various vascular and ocular phenomena of exophthalmic goitre. In neither case was there myxedema, but I have often wondered whether more critical examination would not have revealed some sign of hypothyroidism, such as lessened sweating, peculiarity of loss of hair—so common a symptom in its general terms, and so important and often characteristic when it occurs in the hypothyroid patient, or change in the mucous membranes. So too, the previous history of dysmenorrhoea, so familiar in case-taking that we often leave it impatiently in cases of hyperthyroidism, may be the same kind that we meet and hear of in myxedema histories.

I have the same suspicion regarding the so-called rheumatism of exophthalmic goitre. It sometimes precedes, and sometimes accompanies the typical stages of Graves' disease, as Parry and Basedow both observed. In some cases it is certainly not a rheumatic arthritis, and in others, in addition, it does not seem explicable by any of the usual causes of symptomatic muscular pain. In a case of exophthalmic goitre in which muscular and arthritic pains were most

troublesome, and not relieved by diet or by salicylates, the patient had an unusual degree of asthenia. He also had a curious tendency to lose his hair, so that a very brief exposure to Roentgen rays over the spleen was followed by loss of all body hair as complete as we see in myxedema.

Loss of hair has not been marked in cases of exophthalmic goitre I have seen, and, as I have said in another place, the frontal band alopecia, described by David Walsh as a sign of Graves' disease, like the "cassowary neck" suggests to me hypothyroidism. I think Marine and Lenhart correct when they say myxedema does not precede exophthalmic goitre. Myxedema certainly not, but is it so true as regards all hypothyroid effects? Another significant fact is the improvement noted in some cases of exophthalmic goitre by thyroid treatment, or under iodine. I have seen examples of the former and others of both kinds occur in the literature. It is not possible that in these cases a degenerative lesion or hypofunction caused the hyperfunction, and that the specific treatment, even if not used as such, brought improvement? Of course, it must be remembered that in such cases recovery must not be too readily assumed.

Then too, how often is even typical hypothyroidism, both in infants and adults overlooked! Within a week, while preparing this paper, I have seen a child that had reached the age of four without being put on treatment for sporadic cretinism, and a mild but typical myxedema diagnosed as Bright's disease. Marchiafava has recently called attention to the frequency of the latter blunder.

When we consider the lability of the thyroid, how it swells and shrinks within a few hours, we must realize that it can quickly begin to compensate for lowered function in a part, and that in so doing it may over-compensate, producing symptoms that may early mask those of depression.

One may reject the idea of a dysthyroidization other than hyper- or hypo-function as unwarranted at present, but both for anatomical and clinical reasons I would urge that more attention be paid to the possibility of hypothyroidism in all cases of hyperthyroidism. Perhaps there may be some other change than hypo- or hyper-function, a perversion or dysthyroidism in the common acceptance, but at present the word dysthyroidism is most frequently used to express a dissociation of functions, as Hertoghe used it. Let me consider next some of the chief symptoms of the latter.

Goitre.—Although swelling of the thyroid in one sense is a cause rather than a symptom of hyperthyroidism, there are certain reasons why the gland should be examined in all suspected hyperthyroid conditions. Although the size and physical condition of the gland vary much, cer-

tain signs of importance should be noticed. The gland is usually distinctly enlarged, but the cases in which from the shape of the neck or the small degree of enlargement goitre cannot be made out must be borne in mind. Among recognizable cases of hyperthyroidism, I have found only one in which I could not make out the enlargement, and in suspect cases, none among those examined more than a few times.

The typical Basedowian goitre needs no description, but among all, including those that have developed on the ground of an old and deformed goitre, the vascular murmurs are very valuable indications. They can usually be readily distinguished from murmurs in neighboring vessels, or arising in the heart.

The cardio-vascular anomalies are almost always present. I have seen only two patients with recognizable hyperthyroidism in which the pulse rate and heart action were not increased in frequency. The hypertrophy and dilatation of the heart, the tendency for the apex to be high up, owing to the high diaphragm, and the constant or occasional vascular excitement are all most suggestive. Although the arterial pulsations may raise a suggestion of aortic disease (less properly aneurysm) the differential diagnosis in those respects is rarely difficult.

While tachycardia is a common result of thyroid treatment, it is interesting to note that it may occur in hypothyroid states. Marine and Lenhart observed this in certain cretin pups and Minnich quotes von Cyon's view that it is a hypothyroid symptom.

The cardiac irregularities encountered in hyperthyroid conditions are interesting, but do not aid us in the diagnosis. The vasomotor changes, including the sense of warmth and subjective improvement in cold weather, do not seem to require detailed consideration. They are often of great diagnostic value, just as a marked sensibility to cold is a valuable hypothyroid sign.

The pigmentary changes in the skin are rarely of diagnostic value. I have been especially interested in the history of the so-called Jellinek's symptom described by Ord,—pigmentation of the eyelids, and have found it of no assistance in the early stages and not frequent enough to be important in the late ones.

The nervous symptoms are of great importance and no less variety. All changes from mild depression or exaltation to melancholia and dementia may be seen, but the milder conditions, resembling neurasthenia are most marked and most troublesome to patients. Hysteria may occur, but seems to me very rare in these conditions.

Some disorder of sleep, up to severe insomnia, is present in almost half of all cases of hyperthyroidism and is, therefore, of considerable diagnostic value.

The muscular symptoms are also of great value. Tremor is almost always present, is often

very early and very characteristic, if the few causes of exaggeration of the normal tremor be excluded by examining under proper conditions.

Not less valuable is the muscular weakness, rarely causing giving way of the legs, but not difficult to determine by simple tests, among which the very small diaphragm movement in Litten's test is one of the most exact. The lymphatic change in the leucocyte formula is rarely of diagnostic value, but the blood changes are such as to suggest careful observations in all cases with a view to elucidating the true relations.

The gastrointestinal symptoms are rarely important, unless there are crises, either gastric or intestinal. Such crises should always lead to a search for other evidences of perverted thyroid function.

Emaciation is a much more important sign, since it occurs more frequently, even without gastro-intestinal symptoms and may be a pure hyperthyroidism symptom.

Fever in hyperthyroidism is a rare symptom, but it must be remembered. If it is not, such mistakes may occur as happened to a patient of mine who got a fever of 107° F. while away from home. His tachycardia, goitre and other hyperthyroid symptoms did not weigh against the fact that he was from the South, and he was accordingly given 80 grains of quinine a day for several days without reducing the temperature.

The eye symptoms are of less importance than some others on account of their frequent absence—in $\frac{1}{4}$ to $\frac{1}{3}$ of all cases—and late appearance. It is also becoming more probable that exophthalmos is not due to hyperthyroidism directly, but probably to irritation of the adrenals by the thyroid disease. Practically, the nephritic exophthalmos does not often cause difficulty in diagnosis. Much more troublesome are cases of staring or apparently of exophthalmos in which the history is faulty and the sign cannot be used at all.

The symptoms of hyperthyroid states are protean and innumerable. To catalog them all is rarely of diagnostic importance, and it is much better, in my opinion, to examine carefully into the presence or absence of the most valuable, simply noting others in their proper places, and then to make the differential diagnosis step by step, if the direct one does not appear.

ATYPICAL FORMS OF HYPERTHYROIDIA.*

By ALEXANDER LAMBERT, M.D.,
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MR. CHAIRMAN AND GENTLEMEN:

YOU have asked me to group together for your discussion the atypical forms of hyperthyroidism. To appreciate the aberrant types of any disease, we must have a clear con-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

ception of the standard from which these aberrant forms deviate. I suppose a well-developed case of Graves disease will appeal to most as a really typical form of increased secretion of the thyroid gland. The intense tachycardia, the goiterous swelling of the thyroid, the staring eyes, over the globes of which the lids do not completely close, nor follow the eye as it turns downward, the thin emaciated body from the disturbance of metabolism, the nervous, irritable mentality of the patient, the sensation of heat or actual rise of temperature from which these patients may suffer, the general tremor of the body, and the not infrequent intestinal symptoms of diarrhoea and other evidences of disturbed digestion—all these in a well marked case of Graves disease present a type that is easily recognized, and may well remain as a standard. It has long been said that the exophthalmos, the tachycardia and the thyroid swelling are the three cardinal symptoms of the disease, and many add the tremor. Must we consider as atypical any patients in whom one or more of these four symptoms are lacking, or must we only consider as atypical those forms in which the main symptoms do not appear, and we have various combinations of intestinal disturbances, nervous mentality, disturbed metabolism, with or without tachycardia, with or without the enlarged gland, and the exophthalmos. If we consider only the above standard fully developed cases as typical then they form a minority of the cases and the atypical cases occur in the majority of instances. Any mere clinical description of the various combinations that can occur leaves us with an unsatisfied conception of the morbid processes with which we are dealing, and fails to convey an intelligent idea of the disease. Pathologically, as you know, the enlargement of the gland with its increase in epithelium, is the type of enlargement which produces the greatest intensity of symptoms. Enlargement of the gland with a colloid content of its spaces does not seem to bring with it nearly as much general disturbance. Many cases with various intense disturbances of the nervous system, of the intestinal tract and general nutrition, do not have any appreciable enlargement of the gland. The systemic disturbances are not in ratio to the size of the gland, and the active principles of the thyroid, the nucleoprotein with its iodine content, the thyroid globulin from the colloid are not necessarily in superabundance with the greatest intensity of symptoms, the iodide content of the gland being distinctly below normal in well marked cases of Graves disease, and thus it is believed the symptoms are caused by a condition of hyperthyroidism at a time when often there seems to be a diminished amount of the causal agent present. Viewed from the standpoint of the pathologic findings in Graves disease and the clinical manifestations which we suppose result therefrom, we certainly are not always able to

see a logical sequence of events. We must turn therefore for an explanation to the physiology of the gland and the facts that experimental physiology can give us. There is no question that the thyroid gland discharges into the circulation a secretion which is of great importance to many organs and tissues. There is no question also that while it seems to stimulate under certain conditions the action of the adrenals, it seems to inhibit the action of the pancreas, and as soon as this is realized, we appreciate that we are dealing with a complex physiology of the interrelationship between the various ductless glands. We at once see that the conception that the thyroid alone is concerned in the many atypical forms of Graves disease is an error, and to obtain any intelligent idea of a deviation from type of what stands in our minds as Graves disease, we must consider the various disturbances of metabolism as expressed in the varying relationship of disturbed function in the separate ductless glands of the body. Briefly speaking, it seems at present to be true that the thyroid presides over the nitrogenous metabolism going on in the liver, and that is the nitrogenous metabolism of the body. There is an interrelationship between the thyroid and the pancreas, and they seem to mutually inhibit each other. There is a distinct relationship between the thyroid and the adrenals, in which there seems to be a mutually stimulating interaction. There is in some way an activating influence of the thyroid on the sympathetic system, and thus an increased action through the thyroid secretion on all glandular and secretory functions in the body. Furthermore, it seems evident that if one gland possesses an inhibiting function on another gland, if that inhibition is increased there must be a diminution in the activity of the gland inhibited; or vice versa; if the thyroid through withdrawal of its secretion ceases to exert this inhibition—there must then be an increased action of the other gland, through lack of the normal inhibition. If, on the other hand, the function of the thyroid is to stimulate, an increased action of the thyroid will produce an increased stimulation of some other gland, and there will be an overproduction with the disturbance of the metabolic equilibrium through this second gland, or if the thyroid here ceases to perform its normal function and fails to stimulate enough, there will be a consequent lack of secretion in the second gland, and the failure of stimulation may act in the same way as an increase of the inhibiting power. Furthermore, if it be the duty of some gland, such as the pancreas to exert an inhibiting influence on the thyroid, and the pancreas cease to functionate through some disturbance, such as, for example, lack of proper hormones from the intestinal function, the diminution in the inhibitory power of the pancreas on the thyroid may naturally produce an increased function of the thyroid, and thus an increased

stimulating action on a third gland such as the adrenals which are accustomed to receive stimulation from the thyroid. Thus, while the thyroid is overacting, the break in the proper equilibrium is due to lack of function in the pancreas, and we thus have a hypersecretion of both thyroid, and through it of the adrenals; or, through an increased stimulation from the adrenals to the thyroid, we may have an increased function of the thyroid that overstimulate the sympathetic system, and we have a resulting train of symptoms of flushing, sweating, and general nervousness.

All this may sound very theoretical and of small interest to the practicing physician, but in reality these theoretical combinations which I have just mentioned, are based on facts of animal experimentation, and show through their intricate reasoning the many possible clinical expressions that may occur in the atypical deviations from a single standard type of symptoms. Formerly it was considered that Graves disease was a disturbance of the sympathetic system, and it is true that the tachycardia seems to come from an increased irritation of the heart through its sympathetic nerves. The tachycardia may be present in a simple inflammation of the thyroid, but in these cases the tremor is slight if present at all, and the exophthalmos rarely occurs. In the patients in whom the disturbance of healthy equilibrium is manifested through the sympathetic system as the predominating feature, we see in the milder cases simply the tachycardia, with or without the sense of nervousness and anxiety and præcordial pain and cardiac palpitation. This cardiac disturbance may be the only manifestation that is present. It may be a slight disturbance, or it may go on to a very serious overactivity with cardiac hypertrophy and dilatation, and with a full expression of the nervous anxiety, and the nervous manifestations of the palpitation and disturbed rhythm of the heart action. Often this will be present in simple enlargement of the thyroid, or simple goiter without apparently any other manifestation of Graves disease, or there may be added to it the exophthalmos, double or single. Whether or not overstimulation of the sympathetics produces the tremor, or whether it is produced by an added combination with the adrenals it is difficult to say—but overstimulation of the adrenals in dogs is followed by an intense muscular tremor, and an increased rise of temperature of from one to four degrees, so that where the nervousness and tremor and sense of heat in the skin and rise of temperature is present we may be dealing with simply overexcitation of the sympathetic system or from hypersecretion of the thyroid, with the addition of the excitation of the adrenals. In some forms of tachycardia there is combined with it a blood pressure of above 140 millimetres of mercury, cutaneous pigmentation and gastrointestinal disturbance, such as diarrhea or nau-

sea, vomiting and diarrhea. This combination is the one which Rogers points out to be best benefited by the administration of the nucleoproteid from the pig's adrenal gland,—plus the nucleoproteid from the thyroid. In other words, we are dealing with a disturbance between the thyroid and the adrenals, but apparently more from a lack of proper secretion than from the over-production. Since the discovery of adrenalin or epinephrin, we are familiar with the active control which the adrenals have on the blood pressure. The reverse picture from the destruction of these glands, we are familiar with in our clinical picture of Addison's disease. There is the pigmentation of the skin, a rapid and feeble pulse, loss of strength, and the general condition of asthenia, with the vomiting and diarrhea that is so pronounced in these patients.

The emaciation which the patients in Graves disease show, can be due, of course, to disturbances of the pancreatic function, or be due to disturbances of the influence which the thyroid gland has over the nitrogenous metabolism and the liver. There is good evidence which seems to show that the chromaffin system, of which the adrenals are the chief exponents, the pancreas and the thyroid, seem to have their consummation of functions in the liver. The disturbances of nutrition may be due to a disturbance of the function of the thyroid to pre-empt over the nitrogenous metabolism, or it may be due to a break in the equilibrium of some other unknown function of the liver, or of some disturbance of the pancreas. There is no question of the voracious appetite in many patients of Graves disease, and in spite of that a rapid loss of weight. This can sometimes be controlled by replacing the proteid with fat and carbohydrates, but it is an undoubted expression of the influence of the thyroid secretion on metabolism.

The symptoms relative to the pancreas are clinically unreliable. There is no question, however, that often the nervousness of early Graves disease can be relieved by rectal injections of trypsin, and the insomnia and constipation early in the disease can also be relieved by the administration of some form of pancreatic preparations. Probably also some other of the intestinal disturbances can be referred to lack of pancreatic function. There is evidence to show that there is an interrelationship between the pancreas and thyroid and that certain forms of glycosuria occur through apparently some inhibitive action of the thyroid on the pancreas. The interrelationships between the pancreas and the thyroid are exceedingly blind as far as their clinical manifestations are concerned, but there is no question that in the treatment of Graves disease under certain circumstances, the administration of pancreatic preparations is of the greatest benefit. This short

presentation to you of my own point of view of the atypical types of hyperthyroidism may be extremely unsatisfactory to you as far as any clear cut classification into types is concerned, but the more one studies hyperthyroidism, the more one realizes that it is a varying expression of the algebraic sum of many morbid processes, some of these arising in the thyroid gland, others in the parathyroids, others in the pancreas and adrenals or in the general metabolism of the liver itself, and there are also evidences that the pituitary body and the ovarian secretions are not unimportant in the interrelationship among these many glands, and not without their influence in the varying expressions of the general metabolism of the body. Hyperthyroidism is not an entity. It is not the expression of a single cause. There is not a single pathologic lesion which always produces a definite effect. It is the manifestation of a lack of equilibrium in the relationship of many glands in the body, and this equilibrium may be upset by an increased function or a lack of function of any one of the related ductless glands. We must therefore realize that when we consider the atypical forms of Graves disease, the thyroid gland may be the least at fault, and furthermore we must realize clinically that where tachycardia is present we must think of some disturbance of internal secretion, and not put it down to mere nervousness and dodge the responsibility of an accurate diagnosis. When nervous irritability and change of disposition, when formerly reasonable patients present a veritable "chorea of intellectual functions," we must not put it down to neurasthenia but realize that they are suffering from some internal poisoning which we have been accustomed to consider as part of the symptoms of Graves disease, and which we would recognize if the full picture were present with exophthalmos and goiter and the tachycardia combined. As long as the goiter and the exophthalmos are present, or the tremor with the tachycardia, there is no question that the patient will be quickly placed in the proper clinical group; but it is in these cases in which the symptoms that were formerly considered to be cardinal, are absent, or where they are present only in a slight degree and the manifestations of the sympathetic system, or manifestations of what we are beginning to realize as from the chromaffinic system, or where the intestinal disturbances are the early manifestation, that we usually fail to recognize the chief disturbance as one of upset equilibrium among ductless glands.

MEDICAL TREATMENT OF GRAVES DISEASE.*

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FOR the purpose of this discussion I shall limit the paper to a consideration of the typical cases of Graves Disease, for the reason that Dr. Lambert will discuss the treatment of atypical conditions.

There is probably no one point on which the successful medical treatment so much depends as on an early diagnosis of the condition. It very frequently happens that the responsibility for this situation rests entirely with the patients because they do not present themselves for examination, or call in a physician until the disease has reached a severe degree. It is in the early stages of the disease that Dr. Putnam's analogy between Graves disease and excessive good health finds its justification. The patient may have an excellent appetite and all the digestive functions are carried out with remarkable efficiency. The patient sleeps well, seems to have an abundance of energy, although very little endurance. The cardiac disturbance has not yet become grave enough to disturb the patients, and they frequently state that they feel exceedingly well, and may be more disturbed by a slight enlargement of the thyroid gland causing a cosmetic effect than by any of the serious features of the disease. It is not my function to outline in this paper the conditions which make the diagnosis, but to insist that the curable stage of the disease is the early stage and no physician should resume the responsibility for treating a case of nervous heart, neurasthenia, or any other diagnosis, a case of Graves disease and thereby seriously prejudicing the future recovery of the patient. It has been my experience all too frequently to have referred to me such cases in which the diagnosis could have been made if the physician had only taken the time to make a careful examination of every feature of the case, and had been aware of the fact that the typical symptoms, rapid heart, tremor, exophthalmos, and goiter need not exist coincidentally in order to make an accurate diagnosis. Every patient with tachycardia, or exophthalmos or with a moderately enlarged thyroid with a history of loss of weight, nervousness, sleeplessness, lack of physical endurance, excessive sweating, frequent severe headaches, deserve to be very carefully studied from the standpoint of possible Graves disease, or what is much better termed hyperthyroidism. At the risk of being trite, I repeat that there is no one feature in the medical treatment of Graves disease that is so important for the welfare of the patient as that of an accurate diagnosis at a time when secondary changes have not intervened, and

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thereby seriously interfere with the future recovery of the patient regardless of the method of treatment employed.

The recent literature relating to this condition has been filled with references to the complex pathology of the disease. It has been shown repeatedly on the basis of autopsy findings, which, of course, describe the conditions found only in the serious forms of the disorder, that many of the ductless glands take a part in the disturbance. From clinical observation as well many patients show manifestations which cannot be explained on the basis of a simple over activity of the thyroid gland. However, with fairly typical cases, there is no explanation of the disorder which meets the requirements from the standpoint of disturbed physiology, and from that of success in treatment so satisfactorily as the belief in hyperthyroidism as the direct cause of the symptoms. I shall not make any attempt here to explain why the thyroid gland is over active. We have many instances of diseased conditions in which the glands are over active, notably the glands of the stomach may produce an excessive quantity of hydrochloric acid far beyond the needs for digestive purposes.

For the purpose of this paper I will describe the general hygienic measures, such as rest, diet, climate and throat conditions, as well as the specific means which may be employed to control the over activity of the gland. First, the early typical cases: about 75 per cent. of these patients are young women between the ages of 18 and 30—but the disease may occur at all ages—I have had patients as young as six years and as old as 82. In a large proportion of cases the disease has followed a period of overwork, mental or physical, grief, anxiety, or unusual responsibility, a severe emotional disturbance, or depleting infectious disease. There are, however, instances in which no such origin can be traced, but this forms only a small percentage of the total. Because of this fact there is, in the hygienic treatment of the disease, no one feature which is of so much importance by any method whatsoever as that of rest; and rest does not consist simply in putting the patient to bed. Very frequently physicians believe that by ordering a patient to lie down for an hour in the morning, two hours in the afternoon, and leading a quiet life that they are securing the necessary rest for their patient. Rest must be physical, mental, and emotional, in just so great a degree as it is possible to control these factors. If the disease is well marked it is well to have the patient spend a large part of the 24 hours lying down. In the really severe conditions patients must be in bed for a considerable period and treated with respect to their activity as though they had typhoid fever. Very frequently the rest necessary cannot be obtained in a patient's home as there the various members of the family may prove to be a source of great disturbance. No

mental work can be permitted, or business affairs directed from the patient's bed. In the beginning few or no visitors should be permitted, because of the excessive stimulation in which these patients are living. Very often they rebel at these provisions and declare it to be utterly impossible for them to stay in bed, and make all sorts of excuses for added activity. It may be necessary in the beginning to use a sedative to control the unusual excitement, and excessive stimulation under which they live. It is useless to attempt to treat medically or surgically a patient with active Graves disease who is unwilling to give the necessary amount of time for the rest required. Because they are physically able to be up and about, and feel fairly well, they are unable and often unwilling to appreciate the serious nature of their disorder. The rest must be as complete as possible and considerable time must be spent in determining what are the specific disturbing factors under which they live. Their personal history must be known, the sources of worry and emotional disturbances, and, as far as possible, their fears removed and the whole environment of the patient restored to just as complete a degree of tranquility as the circumstances will permit. Therefore, to simply put a patient in bed answers only a portion of the demand needed for rest.

Diet: Diet plays some rôle in the disease. Experiments on animals have shown that the thyroid is stimulated to unusual activity by the excessive use of meat; therefore it has been my custom to order a diet of simple food without meat or meat soups, and with no tea, coffee or alcohol. In the term meat is included all forms of flesh food; fish, clams, oysters, lobster, chicken and game are all prohibited during the first months of the treatment. I do not absolutely cut off all meat through the whole course of treatment in the majority of cases. A small portion of chicken, oysters, or chop, may be permitted every second day, but I have too frequently found that when general directions for the prohibition of meat are given patients use all forms of meat except beefsteak and pork. The patient should have an abundance of food. The appetite is often abnormal, and although a very large amount may be eaten the patient may lose weight; and in some instances it is not possible to feed a sufficient amount of any kind of food to prevent loss in weight, although the patient's digestive processes may be normal.

Climate: These patients are better during the cold months of the year, and each wave of excessive heat during the summer accompanied by a high degree of humidity is sure to be followed by an increase in the severity of the disease, therefore, when it is possible the patient should be moved to a climate that is cool and dry with an altitude of 1,000 to 1,500 feet. If this is not feasible, a comfortable room with excellent ventilation, equipped with an electric

fan and other means for obtaining comfortable conditions should be instituted. No more unsuitable place can be found for these patients than hot, stuffy rooms crowded with other people, such as we frequently find in the big wards of the city hospitals.

Throat Conditions: It has been a common observation that a very considerable portion of these patients have enlarged tonsils and adenoids, and an acute attack of hyperthyroidism may follow promptly an acute attack of tonsillitis. These patients often give a history of repeated attacks of acute tonsillitis preceding the development of a goitre, with all the characteristic symptoms of the disease. Care must be taken to prevent these interferences or to quit them as much as possible. When the patient can stand the operation, it is advisable to have a complete thyroid enucleation. Such an operation may be quite as valuable to the patient as a ligation of the superior thyroid arteries. The physician should use every care to correct a chronic throat infection and to prevent any acute development of the same.

During the last ten years new methods of treatment have had extensive use in the treatment of this disease, the main purpose of the specific means employed being to control the excessive activity of the thyroid gland. One of the most popular remedies has been the serum of animals thyroidectomized, first suggested by Moebius. The thyroid glands are removed from the animals and they are allowed to live from six to ten weeks after the operation before the blood is drawn. This serum is prepared for use either by hypodermic injection or the dried serum is made into tablets or capsules and given by mouth. The idea back of this method of treatment is the belief that certain toxic substances which are ordinarily destroyed by the thyroid activity, or which appear because the activity of certain glands is no longer inhibited by the thyroid, accumulate to great excess in the serum of the operated animal, and these substances are very valuable to combat the excessive activity of the thyroid patient. The literature of recent years, particularly in Germany, has many reports of valuable results from this serum. My own experience with this method is limited; but I have had some patients who have been decidedly benefited while using it.

The second method advocated originally by Forcheimer is the use of the neutral hydrobromate of quinine in five grain doses three times a day. If the quinine alone does not control the condition, Dr. Forcheimer advocates the addition of one grain of ergot to each five grains of quinine. It is necessary to continue the administration of this drug for a considerable period of time. I have tried this method on more than fifty patients during the last two years. From this experience the conclusion is forced that in the acute cases it is of little value. In the mild chronic cases it often gives distinct

relief; and, I am glad to say, that in three patients who had no visible enlarged thyroid, and in whom no enlargement could be made out by examination, it was the only treatment which would control symptoms. Two of these patients had been operated upon, one of them having ligation of the superior thyroid arteries; the second had had as much of the gland removed as a competent surgeon deemed it safe to take out, and they had continued to suffer from tachycardia, weakness, exophthalmos, and tremor, in fact all the cardinal symptoms of the disease except goitre. No method of medical treatment afforded any relief until the hydrobromate of quinine was used. This remedy proved effective in these three cases to an unusual degree. It has been my custom during the last ten years to give this remedy during the latter stages of serum treatment when the symptoms have in a large part been controlled, when the serum treatment is gradually being discontinued, and the patient is resuming normal activity of life, and my experience leads me to believe that the remedy has been a useful agent in helping the patient through this period.

X-Ray: X-Ray has been advocated as a valuable means of controlling the activity of the thyroid gland. My own experience leads me to believe that there must be quite different methods of applying this by its different advocates, for the reason that I have seen many patients in whom the disease has been aggravated by the X-Ray exposure; in others, in whom it appeared to be a benefit. Personally, I hesitate to recommend its use except in those cases in which there is no evidence that an enlarged thymus gland plays an important role in the disease. Autopsy reports which, it must be remembered, are based upon the findings of fatal cases only, show that in a large percentage of cases the thymus gland is enlarged and active. Whether or not this is a primary condition, or, whether it is a secondary result to the hyperthyroidism, as Hansemann believes is of course undecided. I have advised the use of the X-Ray in a number of those patients in whom there was reason to believe the enlargement of the thymus gland played an important part in the disorder. In these cases, however, it is in the thymus and not in the thyroid which has been exposed to the Ray. Experiments on animals show that a very high degree of atrophy of the thymus is readily produced by the X-Ray, and the results obtained in these cases lead to the conclusion that the action of the X-Ray is beneficial for them. If it had not been my experience to have had many patients in whom the X-Ray had produced increased activity of the thyroid, it would be possible to speak of this method with more enthusiasm.

During the last six years the writer has been using, in the treatment of hyperthyroidism, a serum developed by inoculating rabbits and

sheep with the proteids obtained from human thyroid glands. The reason for using a serum made in this way for this purpose should not be difficult to understand. The symptoms of hyperthyroidism in the human subject are caused, in a large percentage of the cases, primarily by the over-abundant secretion of the thyroid gland. It is not the purpose of this paper to enter into a prolonged discussion as to the nature of the disease; therefore no elaborate attempt will be made to defend the principle just announced. Certain well authenticated observations point almost incontrovertibly to such a conclusion. These observations may be summarized as follows:

1. The gland is enlarged. It has much increased blood supply, and histologically shows marked evidence of an increase in the total amount of secreting epithelium.

2. The symptoms of the disease, such as loss in weight, increased heart action, weakness, increased oxygen absorption, etc., can be imitated by giving to normal individuals large amounts of thyroid preparations.

3. Removal of the gland or a diminution of its blood supply by surgical means relieves the condition, while many observations show that these patients are in most cases more than usually sensitive to thyroid administration.

The gland, therefore, is over active. The function of the gland is not subserved within itself. The secretion prepared in the gland must reach distant organs and tissues. If the gland is over active and an additional amount of the active secretion, which is chemically and iodized proteid, reaches, through the medium of the blood supply the tissues with which it stimulates to unusual activity, we have the complex of symptoms which we recognize in Graves disease. The blood in Graves disease, therefore, must contain an unusually large quantity of the active secretion prepared in the thyroid gland. When this secretion is present in the blood within normal limits, the physiological activity alone is served. When, on the other hand, excessive quantities are present, pathological conditions are produced.

The purpose of the serum treatment is to prepare in an alien species of animals a serum having specific antagonistic properties to the thyroid secretion. The injection of the serum into a patient having Graves disease provides him with a ready made antagonist to a complex toxic substance circulating in his blood.

Briefly, the serum is prepared by inoculating either rabbits (preferably Belgium hares) or sheep with nucleoproteid and globulin prepared from human glands. The inoculation must continue over a period of five to seven weeks, at intervals of about six or seven days before the animal is sufficiently immune to make its serum have decided therapeutic value. At the end of this time the animals are bled and this serum

prepared for inoculation in the usual way. After the first bleeding the animal may be inoculated again two or three times and a second bleeding made, but it has been found inadvisable to repeat this process more than three or four times, since the quality of the serum depreciates after this experience.

During the last six years more than 2,000 cases have been treated with serum prepared in this fashion. These patients have represented all ages and stages of the disease, the younger patient not being more than five years and the oldest over eighty.

Graves disease, or, better, hyperthyroidism, is in itself an extremely complex condition. The patients have represented all the different stages of the disease, and a vast deal of space might be used classifying the various clinical and pathological conditions which have been found. The experience obtained in the treatment of this number of patients has made it possible to differentiate between the different types of the disorder in respect to their suitability for serum treatment, but for the purpose of this paper it will be sufficient to class them into three groups:

1. Patients that have had the disease for only a short time, from two weeks to six months, in many instances in mild form, while in others very severe and acute. All the classical symptoms of the disease may be apparent or one or two of them may be lacking. An enlarged gland with some cardiac disturbance is always present.

2. In this group may be placed those patients who have had the disease for a considerably longer time. The disease has been running a more or less marked course, with occasional exacerbations, with varying degrees of severity. It is intended to include in this group the fairly typical examples of the disease that have existed for some time, from four to eight years.

3. In this third group may be placed the so-called atypical cases, which oftentimes show very curious mixtures of Graves disease and myxedema, and in this group may also be included the patients that have had a history of Graves disease over a very long period of years, and who rarely, if ever, at the time they are seen, present the typical conditions found in the early development of the disease.

The best results in treatment are obtained with patients belonging in the first group. This is true also of the surgical treatment of the disease. No one point in therapeutics is so important as an early diagnosis. If the symptoms are very mild and have appeared within a few weeks, it may be necessary to use the serum for only a short time, perhaps not more than eight or ten injections, extending over a period of two or three weeks. On the other hand, if the conditions show very severe, acute development of the disease, active treatment may be needed for a period of four to six months. The per-

centage of recovery and marked improvements are much better in this first group than in the two following groups. Eighty per cent. of the patients in this first group will be very much improved or cured by serum treatment.

Because serum is used as a therapeutic agent in the treatment of this disease, there should be no relaxation in the other common sense medical measures to be employed. No sane physician would permit a patient having a cardiac disturbance and the general physical debility often seen in Graves disease to be active physically. However, because such patients have no pain, and because until they reach the point of physical exhaustion they often feel very well, an amount of physical activity is allowed them, which is quite unwise and unwarranted.

In the second group are patients who have had the disease for a considerably longer time, and who have reached a point of being physically much more disturbed than those in the first group. The prognosis is not as good. Treatment must be continued over a longer period of time, and the final results are not as favorable. The patient is more likely to be left free from cardiac, nutritional, and nervous disturbance but with a marked exophthalmos, or thyroid gland which has not returned to its normal size. The recovery is slower, the period of enforced rest required is longer, the heart is not as quick to regain its tone, and the reaction toward serum treatment or any other form of treatment is slower and less decided. Fifty per cent. of the patients in this group may be cured or improved to a point where they can follow the usual activities of life without discomfort.

In the third group are found patients who are most difficult to treat. Here it is that the serum treatment has its smallest application. In this group are the patients who have the marked and complex conditions so hard to reconcile with our theories of the disease. Some of the patients show symptoms of Graves disease and others of myxedema. There is evidence that other of the ductless glands besides the thyroid have been involved, and the direct treatment aimed at suppressing the thyroid activity, either by means of serum or by operation, is not always followed by success. Serum may not only do no good to these patients, but it may do harm, and it requires a very careful analysis of each particular case to determine whether or not the conditions that are found are probably caused by an excessive function of the thyroid rather than a diminished function or a disordered function before one can intelligently conclude to use the serum. It is useless to quote statistics upon the results obtained with serum treatment in this group of cases, because it so rarely happens that serum alone can be relied upon as the effective agent.

The serum is administered by hypodermic injection. The writer usually gives it in the up-

per arm, midway between the shoulder and elbow, on the outer side. The needle should be pushed completely through the skin and the serum injected into the subcutaneous tissues. The dose varies. The first dose may need to be smaller than those given later on. It is generally wise to begin with an injection of not more than 8 to 10 minims, and follow this in twenty-four hours, if the reaction has not been disturbing, with a second injection somewhat larger; and injections may be continued daily for the first three to five days, gradually increasing the size of the injection until a full tube, 15 to 16 minims, is given at each injection. These are general directions to apply to the average case. With a patient very acutely ill it may be necessary to give, during the first twenty-four hours, two or three full tubes of the serum. Following the inoculation there is likely to be an area of reaction develop at the site of the injection. This in most instances is no more than an area of redness and induration from 1 to 3 inches in diameter. This condition persists for a few hours and then subsides, so that twenty-four hours later the arm is practically in a normal condition again. It occasionally happens that a patient is extremely sensitive to the serum and shows a very marked area of local reaction. The whole arm from the shoulder to the elbow and down on to the forearm may be swollen, tense, red, painful, and have something of the appearance of an erysipelas. With a patient so sensitive as this it is necessary to proceed carefully. It does not mean that the patient cannot take the serum, but it is very unwise to inoculate a second time until the reaction of the first injection has entirely subsided. If too early an injection is made, the second reaction will be very much more active than the first one, and the first area of reaction will again develop a condition very similar to what it had at first. If the injections are repeated too soon, the reaction at each point will be very severe; the former sites of injection will all react again; the patient will have a fever, be nauseated and ill. The proper method to follow in such a case is to allow the first reaction to subside entirely, then begin with a very small dose, 2 or 3 minims, and allow each reaction to subside before giving the one following; and in a short time it will be found that the size of the injection can be gradually increased until a full tube of the serum is given every second day without any disturbance whatsoever. So severe a reaction as that just described is not a common event. In most instances serum can be given with only a slight area of local reaction and no general disturbance. Very rarely the writer has observed a reaction which shows some of the phenomena of an anaphylactic disturbance. This occurs only very rarely, indeed, and seems to bear no relation whatsoever to the amount of serum injected, the interval between the injections, or the length of time which

the patient may have had serum given. He has observed it to occur after the patient has had serum for three months at intervals of two days. The injection is followed almost immediately by a very severe pain in the back, difficulty in breathing, which may amount to a fairly marked dyspnea, swelling of the eyelids, nose, lips, ears, and marked cutaneous flushing. In two or three instances there has been a short period of syncope. These symptoms very promptly pass, and the patient is soon quite all right again; but after a reaction of this sort it is unwise to inoculate again for a period of two or three weeks. If another inoculation is made within two or three days, the same phenomena are likely to occur again, not invariably so, and it is not possible to quote a very large number of cases on this point because the reaction is so rare; but in most instances in which injection was given again after an interval of two or three days, there has been a development of a similar disturbance, perhaps more severe than that noted at first, and it is best, therefore, to allow a period of two or three weeks to elapse before another injection is made, and then to start in with a small dose, not more than 3 or 4 minims. In one patient such a reaction occurred at three different times, without previous warning, at intervals of about two months. In most cases, however, absolutely no difficulty will be experienced in the administration of the serum.

The length of time which the serum will need to be continued depends a great deal upon the character of the case. The cases that are treated very early in their development may need to have serum given only for a period of three or four months, while in others that have existed for a longer time it may be necessary to give serum for eight, ten or twelve months. One point it is very necessary to bear in mind, and that is that after the patient has been restored to apparent health it is not safe to stop the injection suddenly. The interval between them must be gradually increased until finally an injection is given once every eight or ten days, and it may be necessary to keep up the treatment at this interval for four or five months before it is safe to allow the patient to go free entirely. If the treatment is interrupted when the patient has made very satisfactory improvement and is apparently well, the good conditions are likely to continue for six or eight weeks, and then show a gradual return of the disease. A re-development of the symptoms means that serum must be given again immediately, and a relapse is in most cases readily controlled by this means, but it sometimes happens that a relapse is much more difficult to control than a primary attack.

One further point which should be discussed with reference to these cases is the use of iodine. Since the discovery that the thyroid gland has a secretive absorption for iodine, and that its physiological activity depends upon its iodine

contents, there has seemed to be good ground for the use of iodine in all forms of goitres. Such a conclusion needs to be accepted, however, with a large degree of reservation. Iodine administration to a patient with goitre should be begun with a great deal of care. Particularly is this true with respect to those patients having marked symptoms of thyroidism. In the writer's judgment iodine administration should always be begun with small doses, not more than one grain three times a day. With an active gland the administration of iodine may only feed a flame, and the patient should be under constant observation so that its administration may be stopped instantly when it proves to be injurious. Many comparatively harmless goitres can be started to a dangerous activity by the injudicious use of iodine. Recent experiments indicate that the restoration of an active hyperplastic gland to comparatively normal histological conditions is favored by iodine administration, but it must be remembered that such a gland is capable of using this iodine in the proportion of more active secretion, and iodine administration is in such cases physiologically equivalent to the administration of thyroid extract.

In conclusion, I wish again to emphasize that there is no more important feature in the medical treatment of Graves disease than an early, accurate diagnosis.

THE SURGICAL TREATMENT OF HYPERTHYROIDISM.*

By MARTIN B. TINKER, M.D.,

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IN all but the very most desperate cases of toxic goiter, there is an excellent prospect of a cure by surgical treatment. If surgery is not to be brought into disrepute, however, the question as to whether an operation should be performed or not should be very carefully considered, and if it seems wise to operate, the extent of operation and the time when it should be performed are matters of great importance. Our decision for or against operative treatment and as to what should be done, is governed by careful consideration of the vital organs, especially the circulatory and nervous system. The rate, quality and rhythm of the pulse, possible valvular lesions, the degree of dilation of the heart, the strength or weakness of the heart muscle, are matters of the highest importance. As a general rule, I believe that ligation only is indicated if the pulse ranges continuously above one hundred, also if it is very irregular, or intermittent. Patients with a greatly dilated heart, with serious valvular lesions or with a heart weakened by myocarditis are also

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

bad surgical risks. Operative treatment is by no means out of the question in these cases, but should often be deferred until the condition is improved. It is surprising in many cases how rapidly the heart steadies down, the pulse rate improves and irregularity and intermission disappear after a few days or at the most a few weeks rest in bed with an ice bag over the heart and over the goiter. A blood pressure above or below normal, a low hemoglobin percentage and either low or high lymphocytosis should cause us to hesitate with regards advising immediate radical operation. Extreme restlessness, sleeplessness and pronounced tremor also are symptoms of grave importance. Other symptoms which usually demand delay and preliminary treatment are constant presence of a considerable amount of albumin or sugar in the urine. Almost all goiter patients have a slight trace of albumin and occasionally there is a trace of sugar. These slight and transitory traces are of no particular consequence. The twenty-four hours quantity should be taken as a low output of urea, might also be of serious importance. As regards the respiratory system, persistent cough, bronchial irritation or serious difficulty in breathing may have to be considered. In one of my patients a large pleural effusion was aspirated repeatedly and the patient was under preliminary observation and treatment for over three months before operation was advised. Persistent nausea and vomiting and persistent diarrhea are also indications of serious poisoning and call for delay in operating and preliminary treatment. These extremely toxic cases never get well without operation. If they even live, it is a worthless existence. They are emaciated, weak, nervous wrecks, a constant burden to themselves and their families. However, all but a few of the most desperate cases can be put into reasonable good condition for operation and the measure of health which most of these people enjoy after operative recovery is truly surprising.

The fatalities during the past three years have been very few. Any one who had given the seriousness of the condition of these patients any consideration, would wonder that so many recovered. The fatal results have all occurred among patients with large goiters, from the size of a fist to a child's head. In all cases the disease was of long standing; the duration varying from fifteen to twenty-five years. In all there was serious impairment of the vital organs. I believe it is fair to assume that all would have died from the disease without operation in a relatively short time. Some may feel inclined to make much of even a small mortality percentage, and to minimize the seriousness of the condition of these patients. They overlook the fact that

the death rate in the medical treatment of such cases, as in cancer of the stomach is a full one hundred per cent. During the past three years only relatively few, even of the seriously ill patients, have been refused an attempt at surgical relief. All who have been refused operation have died within a relatively short time after they were seen. In one case the patient died within twelve hours of the time I was called in consultation. Another man who had traveled but a short distance, died from his toxemia a medical death, before he had been in the hospital three days. None of these patients who have been refused operation have lived over three weeks. In some cases I have been strongly urged by the attending physicians and families to operate, but I do not feel that a patient who has only three weeks of life or less is a fit surgical risk. Operation upon such desperate cases is bound to give shockingly bad results and brings surgery into disrepute. Many patients are frightened from having a much needed operation because they know that others have died from an operation for the same trouble, and it is, of course, impossible to lead them to see the difference between their own condition, which may not be at all serious and the condition of the patient operated upon who may have had one foot in the grave at the time he sought surgical relief. It is, of course, impossible to influence all patients in need of surgery to go for operation, no matter how urgently it seems to be indicated. We have done our full duty when we state the plain facts and allow the patient to choose what shall be the treatment of his case.

THE RESULTS OF OPERATION ON EXOPHTHALMOS.

When the protrusion of the eyes is great and has existed for sometime, it is seldom that the eyes return to normal, even after an otherwise entirely successful operation. There is usually a great deal of improvement in the exophthalmos, in fact so that in the majority of cases the patients are not seriously disfigured by it, while the exophthalmos may have been a symptom of serious consequence before operation. In a considerable percentage of my cases there has been injury of the eye through exposure. The dryness of the eyeball, lack of protection from dust and foreign bodies results in a serious conjunctivitis. Several of my patients have had ulceration of the cornea from this cause and in a few others there had been very severe pain accompanying the protrusion. The more serious cases have been referred to an eye specialist for the treatment of the eye symptoms and in all cases the eye has been saved. If the eye does not come back satisfactorily within a reasonable time after thyroidectomy, a special operation for the relief of the exoph-

thalmos may be suggested. In certain cases I have advised the resection of the outer wall of the orbit as first suggested by Krönlein. The original operation has had important modifications from Kocher and at the meeting of the American Medical Association this spring, I shall present some further desirable modifications of this operation. It permits exploration of the back of the orbit and removal of any possible new growth which may be pressing the eyeball forward. In one of my patients whose exophthalmos had received no benefit from thyroidectomy, I found a hemangioma back of the eye which I dissected from the eyeball and optic nerve. It is quite possible that in many severe cases of exophthalmos, the protrusion may be caused by overfilling and enlargement of the vessels. In any case a considerable part of the outer and posterior bony wall of the orbit have been removed, which will permit the eye to go back so that it will be well protected.

In the less serious cases, the ordinary operation of tarsorrhaphy, freshening the margin of the lids at the outer canthus and taking one or two stitches will give the eye protection and greatly improve the appearance.

THE ASSOCIATION OF OTHER GLANDS IN HYPERTHYROIDISM.

A good deal has been said and written about the association of the thymus, the adrenal bodies and even the ovaries and pancreas in producing the symptom complex of goiter. Much has been assumed which cannot be positively affirmed or contradicted for the reason that the function of these glands is not perfectly known. Garre is among the few who have advised the excision of the thymus in the treatment of hyperthyroidism. Personally I have not undertaken this as yet. In my opinion much further study is needed before we can be sure that the other glands mentioned have as important connection with this disease as many seem to suppose. We are, however, in a position to state positively that excision of a part of the thyroid gland does give relief and in a large percentage of cases complete and permanent cure of exophthalmic goiter. If a sufficient part of the thyroid is not removed at the first operation, the best prospect for cure lies in still further reduction of thyroid tissue.

This leads me to speak of another bugbear which has stood in the way of many patients and their medical advisors, when thyroid surgery seemed indicated; namely, cachexia strumipriva. I take it that for many years no well informed surgeon has either excised the entire thyroid or a disproportionately large part of it. There have been a small number of my own cases as well as patients who have come to me from other surgeons who have

not had enough thyroid tissue removed and who have derived much benefit by further reduction in the size of the gland, but I have yet to see a single case in which any serious symptoms have resulted or where thyroid feeding seemed indicated following partial thyroidectomy.

It is surprising how few of those who are interested in this subject are familiar with the important early studies of Halsted, who showed conclusively that if too large a portion of thyroid was removed from dogs compensatory hypertrophy followed with no permanent interference with function.

My own belief is that nature is seldom called upon to bring about such compensatory hypertrophy for almost all of us err on the side of taking too little rather than too much thyroid tissue. The majority of the profession still overlook the fact that many patients with large goiters suffer from insufficient thyroid secretion, for the reason that these large adenomata, cysts and other growths in the substance of the gland press upon and crowd the normal thyroid tissue so as to prevent it from normal function or even entirely destroy it, in the same way that the large ovarian cysts not infrequently crowd out and destroy practically all normal ovarian tissue.

Another matter which deserves mention is the relation of goiter to the voice. In a considerable number of these patients, especially those who have good sized goiters, it has been shown that there is paralysis of one vocal cord before operation. Many of these patients speak fairly well except when they are overtired or have some inflammation. They will tell you that they formerly used to sing, but are now unable to do so. That after prolonged use of the voice they get hoarse or that when they have a bad cold they are hoarse or lose the voice entirely. This paralysis of the vocal cords usually comes as the result of pressure. The general muscular weakness from which almost all who have been long affected with goiter suffer, may affect the vocal cords and musculature of the larynx. In any case it is especially important in such cases carefully to avoid injury to the recurrent laryngeal nerve on the unaffected side and in case of loss of voice after operation it would be a great comfort to the surgeon to know about the existence of paralysis of one cord previous to operation.

With regards to the operation itself, the surgeon should have specially thorough knowledge of the anatomy of the neck. The dissection calls for more accurate knowledge of the details of anatomy of this region than most surgeons possess, without they have devoted particular attention to the subject. Gentleness in manipulation in the early part of the operation until the great blood vessels

with their accompanying lymphatics are securely tied, is of importance, for these are the channels through which the thyroid secretion enters the circulation. In the later stages of the operation when the important blood and lymphatic channels are secured, more vigorous handling is of less consequence. The importance of great care in the arrest of hemorrhage deserves emphasis. This is a very vascular region; the blood vessels are thin walled and easily torn; the blood pressure is usually high and the heart action rapid.

Careful antisepsis scarcely needs to be insisted upon. These patients are so badly poisoned that they stand infection poorly. The use of materials containing iodine is contraindicated for it tends further to overload the patient already poisoned with the thyroiodines.

For many years I have urged the importance of local anesthesia in such cases. The majority of goiter operations can be performed without serious discomfort to the patient if local anesthesia is properly used. There is no objection to nitrous oxide in many cases if the patients wish to have it used but it should always be combined with local anesthesia which blocks the sensory impulses and it is our best preventive of shock.

In recent years I have frequently urged the importance of the many stage operation. Only fifty per cent. of the goiter patients who have come to me recently have been in fit condition for thyroidectomy. Some of these patients are seriously ill after so simple a procedure as ligation of one thyroid artery though in desperate cases a rapid ligation is but a matter of a few minutes. In less serious cases it seems to me advisable entirely to free the upper pole of the gland. It is my opinion that ligation alone is seldom sufficient to give relief from the symptoms and later partial thyroidectomy should be planned for, as soon as the patient's condition permits after ligation. The radical procedure can be undertaken in a varying length of time after preliminary ligation depending upon the sharpness of the reaction. The usual length of time is from ten to fourteen days. In a few cases it is advisable to send the patient home for a rest cure of from three to six months. In advanced cases with serious symptoms, I usually ligate both superior thyroid arteries, operating upon the side of less enlargement first before undertaking an excision. The importance of the many stage operation can be scarcely over-estimated. Patients who could not possibly recover after thyroidectomy get on very satisfactorily after one or two preliminary ligations, in most cases.

In the preparation for the operation and the after care the most important single factor is rest. Not the patients' idea of rest, but accord-

ing to directions definitely stated by the practitioner, which should be strictly enforced.

Rest is needed to take off the strain from the overworked heart. Not only physical rest but mental rest should be insisted upon. In toxic cases the physician in charge should see to it that gossiping neighbors and sympathetic friends stay out, that calls are limited to few of the near relatives for a very few minutes each day. That there is little or no reading or fancy work. Among other general measures of great importance are those which tend to help the patient eliminate toxic substances and which limit the amount of purins ingested. For several years I have kept my goiter patients in the fresh air, much as patients under treatment for tuberculosis. It is surprising to note the rapid improvement of patients who have had a fairly strict rest cure in-doors when they are moved on to a porch. The diet should be as free as possible from the foods producing purins. Eggs are the great staple. Milk comes next in value and there should be plenty of fluids to keep the kidneys flushed of as much waste as possible through these channels of elimination.

Rest in bed with an ice cap over the heart and over the goiter is the most satisfactory way of controlling a rapid heart. The patients have the ice bag continuously except that sometimes they slip out of place when they are asleep. Drugs have little value in most of these cases. Almost all of my patients have had many remedies tried, including the supposed specifics and the serums without any special benefit. Symptomatic use of drugs is frequently desirable. Tincture digitalis or some other reliable heart stimulant may help to steady the heart and pulse. The use of bromides, usually by the rectum, or of other simple nerve sedatives is helpful in some cases. Some of the anemic patients need liberal quantities of fresh beef juice and an iron tonic. The skin should be kept in good condition in order to promote elimination by that channel. All of these measures are of relatively small importance as compared with rest in bed, which should be continued after the operation even for months until the pulse comes to normal and stays there.

MEDICAL AND SURGICAL RESULTS COMPARED.

A number of surgeons feel very strongly that surgical treatment should be advised for goiter patients much more frequently than is now the case. In order to come to any intelligent decision with regards to this matter, we should have at hand definite facts with regards to the ultimate results of both medical and surgical treatment. Unfortunately few internists have furnished us with any facts regarding the ultimate outcome of patients who have been under their care. The only definite

figures which have come to my notice are those reported by Küttner who was able to get information with regards the late results in twenty-one cases conservatively treated at the Breslau clinics during eighteen years. Two died under medical treatment in the clinic; three who had been medically treated died later of heart failure. The total mortality in these conservatively, medically treated patients whose progress was followed in some cases up to fifteen years proved to be 35.7 per cent., a figure as high as the worst results of surgical treatment in the hands of inexperienced operators. Of the survivors, not a single patient considered herself cured and only one was able to follow her usual occupation; a few considered themselves improved, while a large proportion were very much worse than when their treatment was first instituted. It would be very interesting and a highly important contribution if some of our own internists would follow up their cases and give us the ultimate outcome as has been done by Küttner.

I have personal knowledge of seventeen medical deaths from goiter; a number nearly three times as great as my total fatalities during the past seven years in which the great majority of my cases have been operated upon. In recent years the results of surgeons who have had a considerable experience has greatly improved and the number of fatalities under medical treatment of which I have personal knowledge is greater than the total number of fatalities from the clinics, Kocher, Crile and myself during the past three years. At first sight this is a pretty bad showing for medical treatment of goiter, but it is quite possible that some of our progressive men could show much more encouraging results. We all await with much interest the reports of their ultimate results.

PERMANENT RESULTS.

In order to get definite information about the ultimate results in operation for goiter, I have selected from my card index of patients' addresses, one hundred names of patients, most of whom live not far distant from Ithaca, and from all of whom I have been able to get reliable information as to their present condition. There was no intentional selection of these names except to take as large a proportion as possible of those who could be actually examined. 47 patients I have seen personally; 28 several times following operation, and a large number of these patients I see on the street and about their usual occupations occasionally, as well as when they have come to the office for examination. Two of the number died: one a few months after operation from apoplexy; another three years after operation from pneumonia. Both of these patients

were in good condition so far as their recovery from the goiter operation was concerned. Of the patients who have not been examined by me or my assistant personally, I have received reports on nine from physicians. In 44 cases I have only succeeded in getting information by letter. With exception of the two deaths mentioned, all are living from two to nine years after operation. None of these patients are worse than before the operation; all have been either greatly benefited or entirely cured. All of them are able to follow their usual occupations and three have stated that they are in better health than at any previous time during their lives. The greatest improvement is seen during the first six months as a rule, but substantial gain is frequently made up to the end of a year and it is very noticeable that the reports are more favorable the greater length of time that has elapsed following the operation with very few exceptions. A secondary operation for reduction of the size of the goiter had to be performed before there was any satisfactory result in three cases. Preliminary ligation was done in six cases, but it is fair to note that I am at present doing many more preliminary ligations than at the time when most of these operations were performed. Ninety-two patients were greatly improved and in only three cases was the result decidedly unsatisfactory. In at least one of these cases I am of the opinion that other serious organic disease has contributed to the unfavorable result. Certain writers have warned against thyroidectomy in young patients. From my own experience I can see no grounds for apprehension as to the results in young patients. Four of my patients were under fifteen years of age at the time of operation, all have remained in reasonably good health from two to six years following operation. Besides these young patients there were 18 patients under twenty years of age.

Of 19 patients refused operation all died within three months or less from the time that I saw them. It does not seem to me that surgery is justified in the case of patients who have less than three months of life under usual measures of treatment. Of this number five choked to death, the remainder died of some of the results of long continued thyroid toxæmia. Before advising a patient to delay operation I believe every fair minded man should consider the serious possibilities as indicated by Küttner's report and the personal experience which I have mentioned. In uncomplicated cases the risk of partial thyroidectomy surely does not exceed that of operation for acute appendicitis, provided the case is properly handled. There can be no reasonable doubt that many lives might yearly be saved and many others be made far more efficient by timely resort to surgery.

INTRATRACHEAL INSUFFLATION ANESTHESIA, ITS VALUE IN THORACIC AND IN GENERAL SURGERY.*

By CHARLES A. ELSBERG, M.D.,

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IF the chest wall is opened through injury or by the surgeon, the normal difference between the pressure on the inside and on the surface of the lung disappears, and the lungs collapse and remain so. The dangerous symptoms which then ensue (in many, but by no means in all cases) are well known to all. Various methods have been devised to prevent these dangerous symptoms, but none of them have proved satisfactory. Few surgeons ventured to invade the normal chest cavity, with the hope that adhesions between the two layers of the pleuræ were present. Some attempted to cause adhesions to form by the injection of irritating substances. Others recommended that the surgeon should quickly grasp the lung when the chest was opened, pull it into the wound, and fix it there. None of these procedures were sufficiently certain to make thoracic surgery even relatively safe. What wonder, then, that the surgery of the chest was far behind the surgery of other parts of the body! What wonder that the greatest surgeons all over the world considered the surgery of the thoracic cavity as a *noli me tangere*.

About ten years ago were published the epoch-making discoveries of Sauerbruch, made under the stimulus of and controlled by that master of surgery, von Mikulicz. Sauerbruch's idea was to surround the chest of the patient by an airtight box or chamber in which the air pressure was lowered to such a degree that it corresponded to the pressure conditions within the normal pleural cavity. The head of the patient was outside while the surgeon worked inside of the chamber. When the chest was opened, the lungs did not collapse, for the pressure within the chamber was like that of the normal pleural cavity. In other words the difference between the pressure of air inside and on the surface of the lung remained the same as in the unopened chest.

Brauer, another German investigator, accomplished the same end by enclosing the head of the patient in a box or chamber in which the pressure was raised, so that the difference between the pressure inside and outside of the lung remained the same as in the Sauerbruch cabinet and in normal respiration. Both of these methods,—almost equal physiologically,—were found to be entirely adequate to prevent collapse of the lung when the thorax was opened. They became known as the negative and positive pressure methods, and proved a great stimulus to thoracic surgery; positive and negative pressure cabinets were constructed in a number of insti-

tutions. One of the best and most complete is that devised by Dr. Willy Meyer of New York. Intrathoracic operations, only dreamed of by the surgical enthusiast and never before attempted even on animals, were now performed. These were successful as far as the danger from the opening of the chest and collapse of the lung were concerned. Nevertheless, intrathoracic surgery did not develop as rapidly as it should. Only few surgeons and few institutions could possess the large, complicated and very expensive apparatus required. A branch of surgery can only be developed to its full extent when it becomes the property of the many instead of of the few.

This, then, was the condition of affairs when Meltzer and Auer, in the Rockefeller Institute of New York, made their physiological experiments which culminated in the method of intratracheal insufflation concerning which I am going to speak to you.

Before this, however, it is only fair to state, a number of investigators had attempted to devise a simple method by means of which the lungs could be kept distended when the chest cavity was opened. I need only mention the names of Fell, O'Dwyer, Matas, Kuhn, Volhard, Hirsch, Sollman, Robinson, and others.

It is well known that ordinary breathing is kept up by alternating respiratory movements; the ventilation of the lungs depends, therefore, upon the normal activity of the respiratory muscles and the intact condition of the chest cavity. During inspiration, air from the outside reaches the smaller bronchi where the exchange of gases between the inspired air and the air in the pulmonary alveoli occurs through diffusion. Meltzer and Auer discovered that "the ventilation of the alveolar air can be accomplished through a continuous stream of air passing in one direction instead of the double movements in opposite directions." In making some investigations upon the mechanism of breathing in the Brauer positive pressure apparatus, Meltzer and Auer found that if they passed a tube through the larynx of a dog down the trachea almost to the bifurcation, and blew air through this tube in a continuous stream, that the animal could be kept alive for many hours even after all voluntary respiratory movement had been paralyzed by curare. By allowing the stream of air to pass over the surface of ether in a bottle, they were able to anesthetize the animals very satisfactorily, and in these anesthetized dogs, it was possible to open both sides of the thorax widely and to have the animals remain alive for any number of hours. The air and ether mixture was blown in at a pressure of 15 to 20 mm. of mercury. The only conditions for success were that the tube was of a size less than one-half of the diameter of the glottis so that the stream of air and ether which passed up the trachea and out through the larynx and mouth in a continuous stream had free es-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

cape. Later, it was found of advantage to interrupt the stream three to six times a minute so as to allow the lung to collapse for a moment at times and thus to get rid of small quantities of CO₂ which are apt to remain in the pulmonary alveoli. This method of anesthesia, Meltzer and Auer named *intratracheal insufflation*.

The apparatus they used was a very simple one. It consisted of a foot bellows connected by tubes with a bottle containing ether and a mercury manometer; the tubes being so arranged that more or less of the inblown air passed over the surface of the ether and thus became more or less saturated with ether vapor. With this simple apparatus Meltzer and Auer, Carrel, and I, and later others, made a number of experiments on animals. One or both pleural cavities were widely opened, the lungs remained moderately distended, the heart action remained good and regular, superficial respiratory movements persisted, but these had no effect upon the lungs which remained moderately distended.

With this method, I made a large number of experiments upon dogs at the Rockefeller Institute and performed many operations upon the intrathoracic viscera. Among these might be mentioned removal of one lobe or of one entire lung, of both upper or both lower lobes, of one upper and one lower lobe, resections of the esophagus and bronchi, etc. Unless the animals died from the experiment itself or from post-operative sepsis, they regularly recovered and when killed and examined weeks or months later, the lungs were found in perfect condition.

It having thus been proved that the method of intratracheal insufflation was very satisfactory for operations upon animals, and that in animals anything could be done that could be done in the thorax with the positive or negative pressure chambers, the next step was to try it in the human being. First it was necessary to devise an apparatus for the human being, then to test the anesthesia, to learn of its advantages and dangers. All of my first investigations upon human beings were made with great care, and the first cases in which I used intratracheal insufflation were in patients who had stopped breathing, and in whom pure air without ether vapor was insufflated for the purpose of artificial respiration.

The apparatus I use is small and easily portable. Another and larger apparatus, although it is also simple and portable, is meant for hospital use and has been described in detail elsewhere.

THE TECHNIQUE OF INTUBATION.

Although it is possible to introduce the intratracheal tube and then anesthetize the patient, it is preferable to first anesthetize the patient in the usual way and then to introduce the tube. Some of those who have investigated the subject, have had difficulty in introducing the tube. In the beginning I also met with some patients in whom

the tube could not be introduced through the larynx because the tip of the epiglottis could not be reached with the finger as a guide. Ever since I have made use of the laryngoscopic introducer of Dr. Jackson, I have never had much difficulty. The larynx can be brought into plain view and one can estimate the proper size of tube to be used and introduce the tube without difficulty.

One should use an ordinary silk woven urethral catheter, with a lateral opening near its end. These catheters can be procured everywhere and they are sufficiently rigid so that they can not be coughed out of the trachea and rigid enough that they can not be compressed by a possible spasm of the glottis. The catheters have a mark 13 centimeters and 26 centimeters from the tip. When the catheter is introduced up to the first mark, its tip is engaged in the glottis, when the second mark is reached, its tip is about five centimeters from the bifurcation.

The tube is introduced with the head of the patient hanging down over the end of the table and the mouth held open by a gag. One must be sure, of course, that the tube is introduced between the vocal chords and that no force is used. It is then rapidly pushed down the required distance, the gag then removed and the clip by which the tube is kept in place attached. The patient is very apt to have an attack of spasmodic coughing when the tube is first introduced, but this regularly ceases in a few seconds, and one is then ready to connect the tube with the insufflation apparatus and begin insufflation.

For adults, a tube of the size of 24 F. is usually the correct size, but the catheter should always be less in diameter than half the length of the glottis as seen through the laryngoscope. For children, smaller sizes must be used and the tube pushed down a less distance.

Always be sure that the tube is in the trachea and not in the esophagus,—the spasmodic cough is a good proof that the tube is in the correct channel.

THE ANESTHESIA.

I have written elsewhere in detail concerning the characteristics of the anesthesia. I shall therefore pass over this part of the subject with a few words. The color of the patient should be pink, the pulse normal, the breathing regular but superficial. The pressure in the manometer should be kept at about 20 mm. of mercury, and three to six times a minute the current should be interrupted for a moment at a time. When the operation is almost finished, one should shut off the ether and insufflate pure air for a few minutes. Then the patients will awaken very quickly, they will often answer questions before they are removed from the operating room. When the tube is removed, they often have apnea for a part of a minute and then regular breathing again begins.

In almost 500 operations under insufflation

anesthesia, we have never seen any bad after effects. The tube is well tolerated by the larynx and trachea, the patients do not complain of any laryngeal discomfort of any kind after the operation. In not a single instance have we observed any pulmonary signs after the anesthesia. Vomiting is very unusual after insufflation anesthesia, and even after operations lasting several hours, the patients are free from nausea and vomiting.

THE VALUE OF THE ANESTHESIA IN OTHER THAN INTRATHORACIC OPERATIONS.

In addition to the great value of this method of anesthesia for intrathoracic surgery of which I shall speak in a few moments, the anesthesia is very useful in a large number of other operations.

In the first place, it is of great value in cases of intestinal obstruction for it entirely does away with the danger of aspiration of vomited matter and broncho-pneumonia. Because of the continuous stream of air which is passing up the trachea and out through the larynx and mouth, no vomited material matter can be aspirated and therefore under insufflation anesthesia no cases of drowning in vomit can occur.

The anesthesia seems to be especially well borne by weak and cachectic patients, as they seem to be far less apt to present symptoms of shock after an operation done with this method of anesthesia.

The method is of extreme value in all operations upon the head and neck. The fact that the anesthetist can be a number of feet away from the operative field, is, of course, very convenient—the entire space around the part to be operated upon can be covered by sterile sheets and the anesthetist is never in the way of the operator or assistants. The value of the method is also shown when an operation is done in the mouth, such as the removal of the tongue, excision of a tumor of the tonsil, the hypophysis operation, excision of the superior or inferior maxilla, etc. There need never be any fear that blood can run down into the trachea, for the outflowing stream of air and ether continually blows out the blood in the mouth and pharynx. If one has once done an intrabuccal operation such as the complete extirpation of the tongue through the mouth, under insufflation anesthesia, and has seen how easy the operation is made, how the tube is never in the way of the operator, how one need pay no attention to the blood that runs down the throat, how the anesthesia is smooth and the anesthetist never in the way, then one can not fail to recognize the great advantage of insufflation. It is only a repetition to speak of the smoothness of the anesthesia and the advantages to the operator of this anesthesia in goitre operations. The patients do not cough when the trachea is pulled upon or compressed during the necessary manipulations, there is no danger of collapse of the trachea. The same advantages of the method apply to the operation

of laryngectomy. The method is also of value in those operations in which the patient has to lie prone upon the face such as laminectomy and bilateral suboccipital craniotomy. The anesthetist no longer need sit almost under the operating table. When the tube is in place, he can have the apparatus six feet away, if he desires, and can thus manage the anesthesia from a distance.

The anesthesia seems to be very valuable for those patients who have a chronic bronchitis or some pulmonary affection, as the danger from pneumonia seems to be avoided entirely.

I have done at least one of the various operations above mentioned under insufflation anesthesia and in many cases have performed a number of operations of the kind referred to. I can only say that the method of anesthesia has been extremely satisfactory to us, has made all these operations very much more easy and has enabled us to protect our patients from a number of post-operative complications which before this were always a danger and a cause for concern. I have used insufflation anesthesia for every variety of operation that one meets with on a large surgical service in a general hospital.

THE VALUE OF INTRATRACHEAL INSUFFLATION FOR INTRATHORACIC SURGERY.

On this subject I could spend more time than I may take up in recounting to you the many and interesting experiences that my colleagues and I have had. The method is absolutely efficient in preventing collapse of the lung when the normal pleural cavity is opened, and with an apparatus for intratracheal insufflation any surgeon may open the thorax with safety as far as the danger from pneumothorax is concerned. I think the great importance of the method of Meltzer and Auer is that it has made it possible for every surgeon to practice intrathoracic surgery without the large, complicated and expensive positive or negative pressure chambers. The technique is easily learned so that the surgery of the thorax can be developed not by few surgeons but by the many. Needless to say, the method should be very valuable for the battlefield in time of war.

The technique of intratracheal insufflation when the thorax is open, does not differ essentially from that used for other operations. When the chest is widely opened, the lung does not collapse. It remains moderately distended and this distension can be increased or diminished by increasing or diminishing the pressure of the inflowing air and ether mixture. The lungs are immobile although the patient continues to make respiratory movements for the breathing movements are not communicated to the lungs. The lung is therefore quiet, one can pack it away with the appropriate packings so as to expose the part to be operated upon. The lungs usually appear of a pink color mottled perhaps with black. With absolute ease the esophagus, the aorta, the

trachea and main bronchi can be exposed. I have, thus far, performed 14 intrathoracic operations under intratracheal anesthesia with great satisfaction.

Finally I want to call to your attention the value of insufflation of pure air or of air and oxygen as a method of artificial respiration. This is a feature upon which too little stress has thus far been laid. Whenever there is need for prolonged artificial respiration such as in opium poisoning, drowning, etc., the method will surely be very useful. In several instances we have kept patients alive and in good condition for three, four, six, or seven hours, although during that time they never made a single respiratory movement. The color of the patients remained pink and their blood was well aerated. It is a valuable characteristic of this method that the patients need not breathe in order to have oxygenation of their blood occur, the apparatus does the breathing for them. In this respect, the method differs from all other apparatus for this purpose, and, I may add, it has this advantage over both the positive and negative pressure methods for thoracic surgery, in the latter the respiratory movements of the patients are absolutely necessary, without them aeration of the blood can not occur, but oxygenation of the blood will occur just as well whether the patient makes respiratory movements or not with intratracheal insufflation. The patient makes the movements, but thereby does not get any air into the lungs, the apparatus attends to that.

These then, are the advantages and uses of intratracheal insufflation. They seem to be many and important, but much more investigation is necessary before the method is put upon the firm basis necessary. In Mount Sinai Hospital in New York, we have used the method in more than 400 patients with much satisfaction. It has been used in a number of other hospitals in New York and elsewhere, and we will soon have large statistics which will allow us to gage fully the value of the method. Then we shall know whether intratracheal insufflation anesthesia is as valuable as it would seem to be from the experiences up to the present time. I believe that this method of anesthesia has a wide and varied field. Its simplicity, its apparent safety, its efficiency, seem all to point in that direction. The time is near when we shall know the technique of giving gas and air, or gas and oxygen by intratracheal insufflation, and thus its field will be still further extended.

Discussion.

DR. SAMUEL LLOYD, New York City: I think we must all agree with Dr. Elsberg about the advantages of this method of anesthesia in almost every instance he has spoken of. I want to emphasize one thing, however, and that is, he is in error in saying the lung will not collapse when the thorax is opened, as long as only one side is open, and as long as the patient is not completely under the anesthesia. I make that

statement emphatically because I am demonstrating it to my classes at the Post-Graduate every week. You cannot collapse the lung after it has once expanded by leaving the cavity open, and as soon as it is fully expanded its respiratory motion resumes. In the cases of empyema, and in the other surgical cases, I have had occasion to operate upon and remove a section from the lower lobe of the lung, I have resected the lower lobe of the lung four or five times in the human being. I have closed the opening in the trachea in pyopneumothorax by a plastic operation without apparatus of any kind. In these cases the rule is to stop the anesthetic before you open the pleura; open the pleura after the anesthesia is removed and as soon as the reflexes begin to be re-established. If the patient comes out of the anesthetic just as the reflexes are established the slight cough, the slightest strain will begin to distend the lung, and just as soon as it reaches its full distension its respiratory motion is restored. That renders it possible for us to treat abscesses of the lung.

I have had twenty post-pneumonia abscesses of the lung in this way in which I have taken out a lobe two or three times, have taken out cancer, besides all cases of empyema, without any apparatus as long as it has stopped to one side and as long as we stopped the anesthesia before we penetrated the pleura.

DR. JOHN B. DEEVER, Philadelphia: I want to congratulate our friend Dr. Elsberg personally, although I have not had any personal experience with this method of anesthesia, and yet I have been highly pleased with it. My colleague, Dr. Frazer has used it at the University Hospital with most satisfactory results, and I am very glad to pay this tribute to the doctor.

DR. G. FRANK SAMMIS, Brooklyn: This new method is a popular one for many cases, and is in general use on account of its lack of irritation of the lungs. Some have said that it causes irritation of the lungs, but it has been my experience that there is no irritation of the lung from ether administered this way. The use of gas and oxygen has been quite successful with this apparatus. The cotton introducer has been successful in my experience, also the Jackson laryngoscope, which give direct vision of the trachea and vocal cord. Collapse has been experienced by some men in brain surgery, and it seems to be overcome by this anesthetic, and although it may not be used for lung surgery, it can be used in general surgery on account of its pleasant effects, safety, complete relaxation and quiet respiration. Fatalities have been explained and may to a great extent be avoided by more complete understanding of the apparatus. A portable apparatus will increase its popularity.

DR. McWILLIAMS, New York City: Intratracheal anesthesia is as safe an anesthetic as we have, but I would call the attention of the so-

ciety to the fact that it is not absolutely free from danger. I saw a patient die from the direct use of it, the patient having been operated on for suspected adherent pericardium. There was no difficulty in introducing the tube and the chest wall had been opened up, when suddenly it was noticed that the left eye of the patient practically bulged out of the head, and the left eye-lid became enormously distended. The left side of the face became distended, and the swelling extended down the neck, and the patient became blue and died. What happened I do not know. Whether the tube was pushed too far in the bronchus, and the lung was ruptured, I do not know, and I have no explanation to offer. It is certain the air must have rushed along the great vessels into the neck and head. It must have followed the internal carotid into the back of the eye and infiltrated the eye, and then the side of the face and the neck. I cannot explain it except that the patient died as the result of the anesthetic.

DR. CHARLES A. ELSBERG (closing the discussion): I do not feel that I want to go into a technical discussion as to whether the lung will collapse or how we can otherwise prevent the lung from collapsing. When you have an empyema with adhesions the lungs will not collapse. Every surgeon knows that when one pleural cavity is opened in the large majority of cases the lung will collapse, and in a considerable number of cases severe and dangerous symptoms ensue. That is a point in surgery with which we are familiar, and I do not think it need be discussed at this time.

I do not want to speak of the possible dangers of this method and what has happened in several cases, except to say this, that in every single case in which something has gone wrong, and there are three such cases on record, one of them from abroad, and two in this country, there was an error in the technic, as in the case referred to by Dr. McWilliams. I knew of a case that had been anesthetized with a new apparatus, in which several grave errors in the technic were made. In the first place, a soft rubber tube was used which can be compressed by a possible spasm of the glottis; while a silk woven catheter cannot be compressed. In the second place, there was no way of knowing where the end of the tube was. If I heard the facts correctly, the tube was too far down. You can push the tube down and plug one of the bronchi with the tube so that no air can get out, and then the lung will be over distended. There ought to be a safety device by which pressure of the inflowing air cannot go beyond a certain point. If you have an automatic regulator, so that the pressure cannot get beyond twenty-five millimeters of mercury, you cannot do injury to the lung, and will not have these occurrences of which we know several instances. It is important to be familiar with the method and use the right kind of tube, and if you have an automatic blower on the apparatus, so that the pressure cannot rise suddenly,

there is not so much likelihood of injuring the lung from pressure. I say emphatically that these are errors in technic which can and should be avoided.

CHANCE AND THE PREPARED MIND.*

By RICHARD MILLS PEARCE, M.D.

PHILADELPHIA, PA.

(“In the fields of observation chance favors only the mind which is prepared.”—*Pasteur*.)

IT was at the opening of the Faculté des Sciences at Lille, on December 7, 1854, that Pasteur, only thirty-two years of age at the time, but already professor and dean of the faculty, uttered these words in upholding, in his inaugural address, the value, on the one hand, of practical laboratory instruction as an aid to the solution of industrial problems, and on the other the importance of investigation in pure science, even though the resulting discoveries might have no immediate application. The point of view may have been novel when it was uttered, but in the sixty years that have elapsed how familiar it has become! How closely it approximates the ideals of those who are striving to improve the conditions of medical education and of medical research in our own day and country. What better argument can the most ardent advocate of detailed practical instruction in laboratory or hospital (medical training at first hand) present, than that which Pasteur offered in 1854?

(*The author then gives a detailed consideration of Pasteur's argument.*)

. . . what are, conditions to be fulfilled to ensure the “prepared mind” of Pasteur's adage?

The Preliminary Education of the individual is the first, and in many ways the most important consideration. I know it is bringing coals to Newcastle to discuss this question before the students and faculty of Syracuse University, for you have been among the first to recognize the value of two years' college work which shall include physics, chemistry and biology. Still, this principle is not generally recognized. Many of those in positions of authority in our medical schools, while loudly proclaiming the right of medicine to a place among the sciences and, indeed, characterizing it as the “Mother of the Sciences,” deny that a scientific education is a prerequisite to medicine. True, the opposition is frequently due to a realization of the awkward financial position in which an administration might be placed if students' fees diminished. . . .

(*Dr. Pearce then discusses the importance of the preliminary education and of the “do it yourself” or “learn by doing” method in teaching.*)

Influence of the Spirit of Investigation.—But aside from this training the university has another duty to the prospective practitioner of

* An address on medical education, delivered at Syracuse University, May 21, 1912, under the auspices of the Alpha Omega Alpha Honorary Medical Fraternity.

Owing to lack of space this address has been reduced over two-thirds. Abridgement made by H. S. Steensland, M.D., Syracuse University. The unabridged article is published in *Science*, 1912, N. S., XXXV., 941.

medicine. This is its duty in the encouragement of investigation, which is indeed a double duty, a duty to its students and a duty to the community it serves.

As every teacher knows, each class contains a considerable number of men who desire to pursue work, to a greater extent than the conventional course allows, on certain subjects, or by special methods, or less frequently, perhaps, they desire, and are usually well qualified to undertake, minor investigative work. To the former, as well as to the latter, any effort spent in work beyond that given the entire class becomes, necessarily for them, the acquirement of the methods of research and as this means a knowledge of the exact, painstaking methods by which the realms of the unknown are explored, it is an exercise which prepares the student for the daily routine research work of the physician who truly practises his profession. As a training for future work, its value is definitely known and the increased zest and enthusiasm exhibited toward their medical work by men who have had this opportunity are always evident. Pedagogically, therefore, it would seem advisable that every student should have the opportunity for minor investigative effort, in order that he may become acquainted at first hand with the careful methods of experimental medicine. The bearing of the tangible results of his work on the subject investigated is a matter of little or no importance; the vital thing is the increased power which he himself acquires.

(In the full address there is emphasized the importance of having teachers who are engaged in research.)

As to the duty of the university to the community in the matter of research, there can be only one opinion. If the purpose of the machinery of medical education is to "bring healing to the nations," if the business of medicine is to "get people out of difficulties through the application of science and dexterity, manual and physical" (Cabot), then it is the duty of the university not only to teach known principles and methods, but to advance knowledge and methods by research.

On the other side of the question, the university should not forget that medical research tends to ameliorate social conditions by diminishing the causes of physical and mental ills. This ideal of medicine the university and its community should foster and develop, for it is one of the greatest influences in our modern conception of social service; an influence, indeed, which was back of all Pasteur's work, and which he expressed in the statement of his desire to contribute "in some manner to the progress and welfare of humanity."

But aside from this altruistic ideal, I hold that research in the medical school offers important practical advantages to the university and that these advantages should not be forgotten by university authorities, who pride themselves on applying business-like methods to the problems

of education. A policy which attracts a better trained class of students, which improves the character of the instruction, which stimulates the student to a better type of individual effort and which enhances the standing of the university in the community and the nation is a policy which can not be ignored by university president, trustees or faculty.

The Relation of the Hospital to Medical Teaching and Research.—That the laboratories of our better medical schools are fully equipped for the kind of instruction which I have outlined, and that many are already fostering the "do it yourself" principle and the spirit of investigation is well known. In the clinical years, on the other hand, the situation is not so satisfactory. Many a medical school while building and equipping modern laboratories has failed to care properly for its clinical teaching, and has continued to foster the amphitheater lecture. If the method of first-hand instruction, which I have outlined, is to be followed, then the hospital must become the laboratory of the clinical years and a school must own or absolutely control its hospital. This is necessary in order (1) that the heads of the clinical departments may have a continuous service under their immediate charge and to the conduct of which they may bring their own assistants; (2) that in connection with such service they may develop laboratories for teaching and research, in addition to the usual clinical laboratory now used only for purposes of diagnosis; and (3) that resident physicians may be appointed for indefinite service in order that trained teachers and investigators in clinical medicine may be produced in the same way as trained teachers and investigators in the laboratory branches are now produced, and (4) that the head of the department may provide adequately for that intimate first-hand clinical instruction which can be secured only by placing the student in actual contact with the patient.

Some schools, as Pennsylvania, Hopkins, Jefferson and Michigan have already solved the problem by the establishment of their own hospitals. This is naturally the ideal course for all university schools, and a future for which every school should plan. But in the absence of the possibility of immediate consummation of such an ideal, results almost as satisfactory may be obtained by the actual affiliation of municipal or independent hospitals with the stronger medical schools. A hospital has as much to gain by this arrangement as has the medical school, for while the chief duty of the hospital must always be the care of the sick and injured, this duty, as well as its other functions—the instruction of men who are to practise medicine and the advancement of medical knowledge by research—is best served by placing the conduct of the hospital in the hands of men highly trained in the methods of scientific medicine. This would not only enable the hospitals to fulfill a greater function in the development of thoroughly qualified phys-

icians, but it would also be the best for the patients, since they would have the benefit of the best methods of treatment under recognized experts. A campaign of education should be carried on to show our municipal authorities that the hospital will be the best conducted in the interests of its patients and the community at large, if at the same time it is fulfilling its function as a greater center of clinical teaching and research.

Many examples may be presented of the ideal association of charity, teaching and research as the results of such affiliation; the most striking perhaps being the magnificent clinic of Müller in Munich and the clinics of the University of Leipzig. Here, as in many other continental cities and in England, the university authorities by agreement with the municipal authorities appoint the heads of the hospital clinics. The long continuance of this arrangement and the great fame of most of these clinics is sufficient proof that both municipal authorities and university authorities find it mutually advantageous.

We should bring about the same state of affairs in this country and, in fact, a start has already been made. At Cincinnati the large municipal hospital has been placed in charge of the clinical teachers of the University of Cincinnati; in St. Louis, the Washington University has made a close affiliation with the new Barnes Hospital; in Boston, Harvard has made an affiliation with the Peter Brigham and several other special hospitals; in New York, Columbia University and the Presbyterian Hospital have established similar relations; in Cleveland, Western Reserve University has formed a combination with the Lakeside Hospital; in Chicago, Rush Medical College has had for a number of years the medical control of the Presbyterian Hospital, and recently has made similar contracts and arrangements with the Children's Memorial Hospital, the Home for Destitute Crippled Children and the Hospital for Infectious Diseases—Bevan.

How much better such an arrangement would be than that which now exists. At present, in most schools, the clinical teacher is a teacher mainly because he is fortunate enough to control a hospital service, and for this reason has been appointed on the university staff. In his appointment the school has no choice, for it must have for its students the advantages of the clinical material which he controls. Whether he be good, bad or indifferent, as physician, teacher or investigator, he must be retained as long as he holds his hospital position. He, on the other hand, is handicapped by the regulations and restrictions of a not always sympathetic lay board of hospital management and, more important still, by the absence of proper laboratory facilities and the aid of his own colleagues in the departments of bacteriology, immunology, pathology and pathological chemistry. These departments are coming more and more into active participation in hospital work, in diagnosis, prognosis

and treatment, and should be as closely affiliated with the hospital as are the clinical chairs. . . .

. . . Since Ziemssen in the middle eighties established in Munich the principle of a clinical laboratory in the hospital, the idea spread rapidly, until now every hospital worthy of the name has its clinical laboratory for the routine procedures of diagnosis. But this is not sufficient. The clinical chief must have the close co-operation of his colleagues in the departments of pathology, bacteriology, physiology and chemistry, and the student likewise must have the outfits of these departments at hand to aid him in his clinical studies. It is no longer enough to depend on the simpler procedures for the examination of urine, sputum, blood and other body secretions and fluids. The transportation across the city of tissues or fluids for examination in the laboratories of the school can no longer be countenanced. The progress of modern medicine, especially in pathological chemistry and immunology, demands for the benefit of the patient, as well as for the proper instruction of the student, detailed and oftentimes prolonged examinations under the hospital roof or at least within the boundaries of the hospital yard, and under the control not of assistants or internes, or dependent on occasional visits of a professor of pathology, bacteriology or chemistry, but under the constant supervision of such experts who do their teaching and research in the hospital and contribute their share to the diagnosis, care and treatment of the ill of the patients. This is the ideal of social service in medicine, the goal of all effort in medical education and research; and it is not Utopian. Already the University of Toronto has transferred its departments of pathology, bacteriology and pathological chemistry to the grounds of the hospital which furnishes it clinical instruction. Here not only the elementary instruction is given, largely aided by an abundance of fresh material from the hospital, but each advanced student serving as clinical clerk in the wards has always his desk, well equipped locker and special outfit for the detailed investigation of his clinical material by laboratory methods, and moreover, has always at hand his teachers in the laboratory branches to aid him in his clinical investigations. It was my good fortune recently to go over these departments with Professors Leathes and MacKenzie, who explained their workings to me. When I expressed my satisfaction at the ideal union of clinical and laboratory methods Professor Leathes said quietly, and as if there could be no other point of view, "Yes, we expect a student working in the wards to use in diagnosis the methods of pathological chemistry as he does his stethoscope." Do you know what this means? It means that the amphitheater clinic and the didactic lecture are to follow the two-year and three-year course and that the methods and instruction of the laboratory years are no longer to be divorced from the clinical teaching of the later years of the curriculum. . . .

Herein lies the most potent argument for close affiliation of school and hospital. The task both from the teaching side and from the research side, demands united effort, common use of material and common financial responsibility. While any contract between university and hospital must leave the general support of the hospital in the hands of the hospital management, the school must be prepared to pay the salaries of attending staff, the cost of equipment and the expenses necessary for teaching and research and to assume the responsibility for the medical and surgical care of the patients and the general conduct of the scientific work. On the other hand, the hospital should leave the matter of appointments, subject to its nominal approval, entirely in the hands of the school, with the understanding that withdrawal or resignation from the school automatically would sever connection with the hospital, and vice versa. Such an arrangement settles most of the problems of medical education. Continuous service and freedom in the appointment of clinical teachers come as a matter of course. Teaching and investigation can be carried on without interruption. The student becomes a part of the hospital routine and is not an onlooker with limited privileges. The laboratory departments of the first and second years unite to aid the work of the clinicians in the hospital. Clinical teachers may be promoted, if deserving, or may be called from any part of the country, or from abroad; the choice no longer depends on local hospital appointments or on the selfish interests and friendships of local consultants, but on fitness, eminence and skill.

Teachers may be appointed on a university basis, devoting all or most of their time to the care of the patients, to teaching and to investigation. The heads of the departments of internal medicine and surgery certainly should be so appointed.

The Hospital Year.— . . . the State, through its machinery for the protection of the individual, should demand a fifth year of hospital work, and this the public would force the State to demand if the easy-going public was thoroughly familiar with the insufficient requirements of many of our State licensing boards. Indeed, some States are already drafting laws to protect their citizens from the products of the poor medical schools of a neighboring State.

(Various aspects of the hospital year are next discussed.)

. . . The proposition of Professor Peterson, of Michigan, that the council on medical education of the American Medical Association should conduct an inspection and classification of hospitals on the same basis as the inspection of medical schools is most timely. The data thus obtained would do much to clarify the situation, and, doubtless, mutual agreements between certain schools and certain hospitals of the same class could be reached as to the distribution of graduates for interne service. Such

a systematization would allow school and hospital alike to see their defects and to so rearrange their work as properly to care for the greatest number of properly prepared men. . . . to bring about the consummation of this ideal every university school and every community possessing a modern hospital must do its share.

And now finally let me congratulate Syracuse University on the high ideals it has set for itself in the conduct of its medical school. Your course has been watched by all who are interested in medical education. Your responsibility is greater than perhaps you realize; there are those praying for you to continue your present progressive system, others hoping you may fail. Each group desires to point to you as an object lesson. I have full confidence, however, that the wise trustees of your university, supported and encouraged by your alumni and the physicians of Syracuse and its surrounding territory, will not only maintain the present high standards, but will inaugurate still greater advances and thus ensure for the practitioner of medicine in this community the "prepared mind" of Pasteur's adage.

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SYPHILIS OF THE STOMACH.*

By JEROME MEYERS, M.D.,

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SYPHILIS of the stomach is a rare condition, both as an autopsy finding and as a clinical entity. It is an important condition, all the possible symptoms and presentations of which should be freely known, because, in some cases, needless and fatal operations have been performed under mistaken or symptomatic diagnoses; in other cases, patients have suffered over long periods of inefficient diagnosis and treatment. Moreover, even in the cases recognized as gastric syphilis, periods of weeks or months have elapsed before the true etiological cause was fixed. Therefore, the report of a new case of syphilis of the stomach, and a comprehensive review of the known cases with a comparison of their findings, are of interest and practical value. The writer's own case is as follows:

Mr. X, aged 24, first seen May 27, 1911.

Family History.—Father died of pulmonary tuberculosis at 35.

Past History.—Typhoid when young. Four attacks of gonorrhoea, the last two and one-half years ago. Syphilis five years ago; conscientious

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

mercurial treatment until one year ago. Wassermann reaction said to have been negative in March, 1911. No alcoholic abuse.

General History.—Fairly marked nasopharyngeal catarrh. Slight occasional cough with scanty expectoration. No dyspnoea or headache. Slight vertigo, ascribed to "biliousness." Frequent night-sweats during the winter, persisting until five weeks ago, accompanied by chills and fever. Feels weak and exhausted; has lost 20 pounds since January 1st, and fears that he is suffering from tuberculosis. No disturbances of the special senses.

Abdominal History.—First symptoms, noted six or seven months previously, are constant with exacerbations. Tongue heavily coated every morning. No dysphagia. Has dull pain, the initial seat of which was under the right costal margin, but then spread across the median line, to localize itself at present under the left costal border, and in the umbilical region. This pain occurs immediately after eating, especially after heavy meals, lasts one-half hour. No hunger pain. No eructations of food, sour liquid, or gas. No pyrosis. No hæmetemesis. Vomiting on only one occasion. Intestinal movements fairly regular, bear no relation to the attacks of pain.

Physical Examination. May 27, 1911.—Medium height, well developed, somewhat emaciated, moderate facial acne, teeth normal, gums receded, tongue coated, pharynx normal. Eyes react to light and accommodation. No facial or lingual paralyses. Lungs normal except for distant subdued respiratory sounds all over both posterior surfaces; no râles. The apical projection areas are fairly equal in extent. Cardiac areas not enlarged, sounds normal, but distant, no murmurs.

The abdomen is flat, the costal angle normal. There is well marked muscular tension in the epigastrium and under both costal margins and below for a distance of about 4 cm.; also over the probable position of the pylorus. The lower border of the stomach is two finger-breadths below the umbilicus with the patient reclining, five when erect. There is marked succussion. No tumor palpated. The pylorus is not palpable. No great tenderness to pressure. The spleen is slightly palpable. The liver is normal in position and not palpable. Gall-bladder normal. Kidneys not palpable. The regions of the sigmoid, cæcum and appendix normal.

On the anterior aspect of the left knee is a large copper colored ulcer, the center of which contains pus. Erythrocytes 3,300,000. Differential count. Polynuclears 65%, small lymphocytes 30%, large 1%, transitionals 3%, eosinophiles 1%. No plasmodia. Purulent material from sore on knee shows fibrin with a very few leucocytes; not stained for spirochæte pallida.

Writer expressed opinion that the stomach condition might be due to old syphilis, and advised patient to enter hospital for further investigation.

May 31st.—Ewald test. Breakfast, one hour, removed 40 cc., well-digested, little mucus, no

tissue particles. Free HCl 42, total acidity 62 degrees. Microscopically no blood, pus cells, infusoria, amœbæ, sarcinæ, yeasts or lactic acid bacilli. No chemical blood.

Feces.—No connective tissue, muscle, fat or starch rests. Hydrobilirubin normal. No chemical blood with benzidin, phenolphthalin or guaiac. No parasites.

Urine.—Indican + Urobilinogen slight in the cold. No bile. No casts. Mucus + + Pus fairly frequent. Patient put on ulcer diet and a mixture of papain, magnesium oxide, ext. belladonnæ, and resorcin.

June 8th.—Patient reports some subjective improvement in the matter of pain, but has had fever and sweats. The pulmonary condition is unchanged. Polynuclears 79 per cent., small lymphocytes 10, large 6, eosinophiles 5. There is now marked rigidity below the left costal margin under the rectus muscle, and more pronounced tenderness to pressure. Patient strongly advised to enter hospital.

June 10th.—Entered the Albany Hospital. Hot fomentations applied to entire abdomen every two hours. The rigidity in the left side soon lessened, so that on the 11th there could be palpated an irregular mass, slightly nodular, fairly hard, under the left rectus, extending 4-5 cm. from the border of the ribs, painful to pressure, moving with respiration. Spleen distinctly palpable, 1.5 cm. below ribs.

The temperature taken every two hours showed June 10th, 99.2 at 2 P. M., 99 at 4, 100.2 at 6, 100 at 8, 99.4 at 10, 98.6 at midnight. June 11th, normal except at 8 P. M., then 100. June 12th, 99.4, 99.8, 99.4 at 12, 2 and 4 P. M. June 13th, 99.4, 99.2 at 10 and 11 A. M.

Von Pirquet reaction negative. No blood in stool. Specimens of sputum on two separate days show no tubercle bacilli. Leucocyte count June 12th, 14,600; June 13th, 8,000. Wassermann reaction strongly positive. Blood culture proved negative to any bacterial growth.

Patient returned home on the 13th, remaining in bed on account of temperature.

June 16th.—Fluoroscopic and radiographic examination. The former was not satisfactory, as the high position of the lesion rendered this method difficult. A radiographic print taken leaves no doubt that the seat of the trouble is in the stomach, and in the region just under the tumor mass palpated, the lesion being very probably in the form of a widespread gummatous infiltration of the walls of the stomach, the mucosa being little, if at all, invaded. It is very probable that the pylorus may be somewhat stenotic as shown in the radiograph, and as indicated in the history and physical examination. Dr. Arthur Holding, who made the radiographic plates and prints, agrees with the writer, saying, "the radiograph shows a bismuth shadow of a 'dipper' shape, the handle of the dipper corresponding to the cardiac portion, the reservoir of the dipper to the dilated pyloric half of the stomach. The 'magen-blase' is visible in its

normal position; immediately below it the walls of the stomach are symmetrically contracted, so that the lumen of the stomach is represented by a bismuth line about 2.5 in diameter. This extends about 6 cm., when the walls again expand symmetrically on both curvatures. The bulk of the bismuth meal is contained in the pyloric half of the stomach which is dilated, the marker on the umbilicus showing midway between the upper and lower borders. Peristaltic waves are visible about the antrum. The rugæ are distinctly visible in the contracted portion of the stomach."

Diagnosis.—The history of pain, occurring immediately after eating, the lack of hæmetemesis, of occult blood in the stomach contents and feces, the failure of benefit from an ulcer diet, the history and signs of syphilis, the positive Wassermann reaction, the absence of tubercle bacilli in the sputum, the results of radiographic examination, all render a clinical diagnosis of gastric syphilis justifiable and logical. The diagnosis was substantiated by the result of therapy. Under 15-drop doses of KI and daily inunctions of mercury, which gave no gastric discomfort, the patient, in a few days, lost the subjective symptoms of pain, the rigidity markedly lessened, the tumor mass became very soft on palpation, and tenderness to pressure disappeared entirely. The patient during this time remained in bed and most carefully registered his temperature over a period of two weeks after beginning treatment. At no time did he have a rise of temperature or night sweats. He was last seen July 8, 1911, at which time he had gained ten pounds, his appetite was exceedingly good, and he had no pain on eating. A mass could still be felt under the left rectus, but softer than at first, with no rigidity or tenderness. Patient shortly afterward left for a distant state. In a letter of January 3, 1912, he states that "I am still taking ten to fifteen drops of potassium iodide a day, my stomach is not giving me a particle of trouble, I have no pain, no tenderness or any other indication of the old trouble."

Coming now to a study of the recorded cases of syphilis of the stomach, the writer has carefully studied and tabulated some fifty or sixty more or less completely reported instances of the condition, both congenital and acquired. The comparative etiology, pathology, symptoms, prognosis, and treatment of the cases will give data of interest and practical value.*

First, then, as to etiology. Taking into consideration the cases of acquired syphilis only, we find that, of forty-nine cases, thirty-one are in males, that the youngest case is at the early age of eighteen, the oldest at sixty, that the earliest incidence after the primary infection was ten months, occurring, it may be noted, in the youngest case, the latest incidence after infection was twenty-five years, in a man of forty-eight. Four cases showed gastric symptoms as early as two years after the initial infection, two after four years, two after five, and then the periods range

through six, seven, ten, fifteen, sixteen, twenty and twenty-five years. From the data at hand, one case occurred between the ages of ten and twenty, four between twenty and thirty, fifteen between thirty and forty, ten between forty and fifty, seven between fifty and sixty; so that the greatest frequency by far lies between thirty and forty, and forty and fifty, inclining one to the conclusion that the great majority, if not all the authentic cases of gastric syphilis, are of the tertiary period, and that, while it is possible that syphilis of the stomach may be more frequent than medical records show, or that secondary syphilis may often give independent gastric lesions, it is, however, very probable, from a close study of all the cases of gastric syphilis with the statistics above given, that gastric syphilis is a tertiary manifestation, and other cases are to be explained by the general metabolic and hæmatogenic disturbances coincident with a general infection such as syphilis is.

Reviewing the pathology of the cases, some interesting conditions can be adduced. Firstly, we find, markedly in the congenital cases, a multiplicity of lesions, that is, the gastric lesion is only a concomitant, or local manifestation of a general condition, evidenced by synchronous gummata in the liver, small intestines, bones or lungs. This plurality of lesion is not so evident in the acquired cases, but it may exist, as in cases five, nine, thirteen, fourteen and twenty-seven, or there may be a very well-grounded suspicion in purely clinical cases, as in case fifty-five and the writer's, in both of which there were pulmonary findings. Secondly, any region of the stomach can be involved, so that no conclusions regarding any relationship between the site of the lesion and its character can be drawn. Thirdly, we find multiple lesions in the stomach, not only in the congenital cases, but in the acquired as well, three to five to thirteen lesions being found at autopsy, while the clinical often present symptoms and physical findings of plural lesions. Fourthly, we find a variety of lesions, from the gumma to ulcer and peritonitis, the lesion usually originating in the submucosa, often involving the muscularis and serosa, or invading the mucosa with consequent ulceration. The gumma can be situated in any region of the organ, can vary from microscopic size to that of a pea or even the palm of a hand, may be strictly localized, or widespread in the submucosa, growing around a large arc of the circumference of the region invaded. At or near the pylorus, it gives rise to typical physical findings and subjective symptoms of stenosis due to neoplasm. It may ulcerate, forming a deep ulcer, and lead even to perforation. At other times the gumma may infiltrate diffusively, large areas being thickened, as in case thirty-eight, the microscope showing characteristic cellular gummatous proliferation from the submucosa. Again, the proliferation may be very dense and especially fibrous, particularly about the pylorus, attacking even the serosa and other peritoneal parts of the abdomen, as in cases thirty-eight, fifty-one, fifty-two and fifty-

* For tables see pages 536-541.

three, so that pylorus stenosis results, or large parts of the stomach are involved and shrunken, giving rise to such diagnoses as linitis, chronic hypertrophic gastritis, hypertrophic stenosing submucous sclerosis, pyloric sclerosis. This variety probably represents advanced stages of syphilitic involvement that has attacked large areas in the gastric walls or extended to the peritoneum, the lesions in both places characterized by the predominance of dense connective tissue. Ulcer may be primary or secondary, probably more often in the latter category, due to degeneration of gummata. Hemorrhage occurs, due to erosion of blood vessels in necrotic gummata, primary ulcer, or as a result of endarteritic processes. Finally, through massive infiltration or adhesions, we may get hour-glass contraction, as in case forty-one. The pathology of syphilis of the stomach presents the protean character found in other systems of the body; it presents all the possible conditions of gastric disease, so that we might justly say, if we could recognize all the various forms and consequent symptoms of syphilis of the stomach, we should be able to diagnose nearly all the organic gastric diseases.

Considering now the symptoms and diagnosis as shown by the recorded cases, it can be seen that the former have often little that is absolutely characteristic, while the latter is sometimes the result of successful conjecture, other times the result of elimination through time and unavailing treatment for ulcer, cancer, or what not. The diagnosis has been made at autopsy, at operation, and on a priori grounds of antecedent syphilis with suspicious gastric symptoms. Very often the true diagnosis has been delayed weeks and months, and this is natural, because of the rarity of the disease and its lack of individual symptoms. It would seem, however, with so many cases of general syphilis, that the condition should be of more common occurrence, and it is very possible that, if the more intractable cases of apparently simple ulcer or protracted cases of gastric tumor with more or less anomalous symptoms and findings were more closely studied, the condition might be more frequently encountered and cured. But whatever the probabilities, the reality is that the diagnosis must remain very much a matter of personal acumen. There are, however, some indices that should warrant the diagnosis. Firstly, of course, is the establishment of precedent syphilis in the history of the patient, or by the Wassermann reaction. The matter of history should include any condition of the special organs as the nose, throat, eye, or skin, for as seen from the recorded cases, the finding of scars, with a confession or sudden recollection of necrosis or ulcer, has enabled a proper diagnosis with cure, or even the saving of life. Not only the patient, but the wife or husband should be thoroughly questioned and examined. Secondly, and of great importance, is the failure of cure or relief by classical diet or drugs. Thirdly, is a group of symptoms, met singly or combined, in so many of the clinical cases, that considerable diagnostic importance

must be ascribed to them. These symptoms are pain, tenderness, emaciation and hemorrhage, symptoms found not only in the cases of ulcer, but in gumma, and the infiltrating, stenosing forms of the disease, a fact which would seem to show that the symptoms are in the main dependent on the syphilitic factor rather than the form of the lesion, or else, what is very probable, we may have similar symptoms in many cases due to the tendency to multiplicity and variety of lesions as emphasized under the pathology. Not uncommonly is more than one region of the stomach affected by the same or different form of lesion. At any rate, pain is of frequent occurrence, presenting as a cardinal symptom in sixty-seven per cent. of the recorded cases. It seems especially prone to occur immediately after eating, a condition explainable by the pressure of food on walls rendered less elastic by gummatus change, or by spasm due to irritation. Nocturnal pain is found in some of the cases and especially mentioned by some of the authors, but this fact must be considered, that in non-specific cases nocturnal pain is often met with. Tenderness to pressure is often very marked, probably more so than in early carcinoma, the result of the extension of gummatus processes from the submucosa to the serosa. Hemorrhage, found in thirty per cent., is often so profuse as to be fatal, and may be the first symptom. Blood in the stomach does not necessarily occur as the mucosa may be intact, as in case fifty-one and the writer's. There may be bloody mucus, as in case twenty-eight, associated with anacidity, raising the question whether some of the reported cases of so-called achlorhydria hæmorrhagica gastrica⁵⁹ are not basically luetic. Emaciation is a marked symptom, the patients losing flesh rapidly, whether the condition be clinically that of ulcer, tumor or stenosis; in forty-seven per cent. loss of weight is so prominent as to be almost the predominating complaint. Vomiting occurs, but is more or less dependent on the site and results of the lesion, rather than its syphilitic nature. Physical examination gives the same findings as in other organic gastric conditions of tumor, ulcer, stenosis, etc.; especial attention should be directed, of course, to the palpation of multiple lesions in different areas of the stomach, and the extreme tenderness with its associated rigidity. The test-breakfast here gives no more definite diagnostic data as to the exact nature of the lesion than it does in any other condition. It must be interpreted with other findings. The gastric juice has been found normal, hyperacid, or anacid, the motility, of course, depends on the site and character of the lesion, the microscopical characteristics vary with the acidity, the motility, and the integrity of the mucosa. The matter of rise of temperature is not extensively mentioned in the series of cases, but it should be an important factor, firstly, because a pulmonary involvement may give very active variations of temperature with chills and sweats in every way simulating tuberculosis; secondly, because visceral syphilis *per se* can cause fever.⁶⁰

Naturally, any râles or abnormalities of respiration, as in cases nineteen, fifty-five and the writer's, are of great moment.

It would seem best, after an examination of the pathology and symptoms as reported, not to attempt too strict a classification of the clinical cases, but to say that we have cases of gastric syphilis that present symptoms (1) of ulcer in various parts of the stomach and its results; (2) of gumma in various parts and its result as a tumor; (3) of widespread infiltrations of a gummatous or more fibrous character leading to deformity, cicatrization or involvement of the peritoneum or neighboring organs; (4) of combinations of these lesions, causing a variety of symptoms and involved findings on physical examination.

The prognosis is extremely good, provided the patient is not too debilitated by the mechanical effects of a tumor, or if there are not dense adhesions and peritonitis. The latter cases are not very favorable as to recovery unless recognized early and treated surgically. It is probable that mercury or the iodides are of little or no benefit here. In the other cases, even of advanced tumor or profuse hemorrhage, the use of mercury in any form and of the iodides gives brilliant results, oftentimes in a few days, and, in all but a few cases, has led to complete relief of the symptoms. If the tissues of the stomach are completely repaired is another question; it is doubtful; case fifty-seven is very interesting in this connection, for with relief of symptoms of pain, emaciation and retention, the gastric juice, which had been anacid, showed no change after nine months' treatment with KI. The use of 606 is, of course, indicated with the same precautions as in other syphilitic disorders.

From our consideration of the various phases of the cases of syphilis of the stomach, we may draw the following conclusions:

(1) It is a rare manifestation of syphilis, congenital or acquired, occurring mostly in males, especially in the fourth and fifth decades, but also at almost any age.

(2) Its pathology is characterized by (1) multiplicity of lesions in many organs, (2) by variety and plurality of lesions in the stomach itself.

(3) Its symptomatology corresponds to the pathological findings; it presents no unanimity of symptoms.

(4) There are four symptoms which are, however, fairly common, singly or combined. These are (1) pain, especially immediately after eating, (2) emaciation, (3) tenderness, (4) hemorrhage.

(5) Clinically, we should not divide cases of gastric syphilis too strictly, as an exact diagnosis of the form of lesion is often impossible, except by operation or autopsy.

(6) We may classify syphilis of the stomach under (1) ulcer in any part of the stomach and its results, (2) gumma in any part and its sequelæ as a tumor, (3) widespread infiltrations of gummatous or more fibrous character leading to deformity, cicatrization, or involvement of the

peritoneum or neighboring organs, (4) a combination of two or more of these.

(7) The diagnosis is extremely difficult as a rule. If there be a clear history of syphilis, or if the Wassermann is positive, the diagnosis should be comparatively simple.

(8) The proper diagnosis is extremely important, as exitus may occur through hemorrhage, inanition, or stenosis, when timely intervention could have cured. Even when properly diagnosed, many of the cases have suffered delays through false diagnosis and treatment.

(9) Any form of mercury or the iodides give as brilliant results as are to be found in the practice of medicine.

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CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
1. KLEBS	M. Acq. Syphilis.		(a). Skin scars, fresh ulcerations, gumma lungs, liver and intestines. Gumma, post. near cardia. Muc. memb. thick, and sieve-like with ulcer base. Granulation tissue from submucosa.	Gumma. Gummata of lungs, liver and intestines.	
2. CORNIL & RANVIER	F., 39. Acq. Syphilis.		(a). Gumma of liver. Small gummata of lesser curvature near pylorus. Thickening of wall in form of flat tumors. Granulation of embryonal cells of submucosa extending to muscularis and serosa.	Multiple gummata. Gumma of liver.	
3. WEICHSELBAUM	M., 25. Acq. Syphilis.	Erysipelas.	(a). Signs of general syph. in pharynx, larynx, nose, cranium and liver. Two gummata of post. wall between fundus and pars pylorica showing ulcers with scar basis.	Multiple gummata. General syphilis.	
4. BIRCH-HIRSCHFELD	M., 35. Acq. Syphilis 4 years before.		(a). Gumma from esophagus to stomach showing ulcer with smooth, partly caseous base and fibrous thickened edges. Scars in liver. Gummata plaques in small intestine. Gummata infiltration of bronchial and lower mediastinal glands.	Gummatous neoplasm. Gummata of small intestine and lymph glands.	
5. BIRCH-HIRSCHFELD	F., 45. Acq. Syphilis 6 years before.		(a). Gumma, pars pylorica, as superficial large slightly ulcerated plaque with thick nodular edges. Proliferated submucosa, nodular, cicatrizing. Obliterated vessels. Gumma of liver.	Ulcerated gumma. Gumma of liver.	
6. BIRCH-HIRSCHFELD	New-born. Congenital Syphilis.		Gumma of pars pylorica. Projecting white thickening size of palm. Granulation tissue in mucosa, submucosa, and muscularis. Thickened vessels. Gummata of lungs and liver.	Gumma. Gummata of lungs and liver.	
7. BIRCH-HIRSCHFELD	M., 3 yrs. Congenital Syphilis.		(a). Gumma of cardia in form of ulcer, hard gummatous edges. Gummata in glands and small intestine.	Gummatous neoplasm. Gummata of glands and small intestine.	
8. CHIARI	M., 3 weeks. Congenital Syphilis.	No gastric disturbances. Icterus.	(a). 5 gummata larger curvature and fundus, circumscribed, raised, partly superficially ulcerated and plaques. Gummatous perivascular infiltration from submucosa. White pneumonia. Osteochondritis. Gummata of small intestine and liver.	Multiple gummata. Gummata of small intestine and liver. Syph. pneumonia.	
9. CHIARI	M., 23 yrs. Acq. Syphilis 2 years before death.	Frequent vomiting, pain, diarrhoea. Intis.	(a). 4 thickened plaques, one ulceration perforating, size of palm, on post. and ant. walls. Gummata of lungs, liver, kidneys, intestine. Edges of gastric lesions show proliferation of submucosa.	Gummata and ulcerated gumma. Gummata of lungs, liver, kidneys, intestine. Tbc. of lungs.	
10. BITTNER	M., 2½ hours. Congenital Syphilis.		(a). 7 gummata of ant. wall, pea-size, hard, white plaques of granulation tissue from submucosa attacking mucosa muscularis and at times serosa. Pneumonia alba. Osteochondritis. Gummata in liver and intestine.	Multiple gummata. Gummata of liver and intestine. Pneumonia syph.	

CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
11. BITTNER	Macerated fetus. Congenital Syphilis.		(a). One small, pea-size, white, hard infiltration with upturned edges superficially ulcerated. Gummata of lungs, liver, small intestine. Osteochondritis. Pemphigus syph. Granulation from submucosa, especially about the vessels.	Gumma. Gummata of lungs, liver and small intestine.	
12. BITTNER	Female.		(a). Occ. thickening of walls. Gummata in lungs, liver, small intestine and kidneys. Adrenals diseased. Gummatus thickening of submucosa and mucosa.	Gummatus infiltration. Gummata of liver, lungs, intestine, kidneys.	
13. BUDAY	M., 47. Acq. Syphilis. Pain, blood in stool, course very similar to carcinoma.		(a). 3 gummata, 2 large curvature, 1 near pylorus wall thick, and neoplasms show deep necrosis. Proliferation of submucosa. Partial atrophy of muscularis. Gummata of mesentery, kidneys, liver, small int. and tongue. Splenic tumor.	Ulcerated gummata. Gummata of liver, kidneys, small intestine, mesentery.	
14. FRAENKEL	M., 47. Acq. Syphilis. Pain in epigastrium, especially at night. No free HCl. in the stomach. Perforation and death from ulcer of small intestine.		(a). 13 ulcers in the stomach. The mucous memb. thickened and ulcerated, due to gummatus infiltration. 31 ulcers in small intestine.	Gummatus infiltration with ulcer formation. Multiple ulcers of small intestine.	
15. OBERNDORFER	M., 4 months. Cong. Syphilis. Pain and diarrhea.		(a). 6 gummata of post. wall which is thickened and shows superficial ulceration. Gummata particularly in mucosa arising from submucosa. Gummata of liver, small int. and adrenals. Splenic tumor.	Gummata. Gummata of liver, small intestine, and adrenals.	Biniodide Hg. Pain less after 6 injections. After 12 pain and vomiting cured.
16. DIEULAFOY	M., 18. First symps., 10 months after infection. Pain in epigastrium, worse after eating. Frequent vomiting. Profuse hemorrhage. Emaciation.	Tenderness at tip of xyphoid. No dilatation.		Ulcerating gumma.	Recovery on Hg.
17. DIEULAFOY	M. History of suppurating glands of the neck. Sudden profuse hemorrhage without apparent reason, followed by several more next day.			Hemorrhage.	
18. ANDRAL	F. Pain and vomiting not relieved by treatment. Ulcer on post. wall of pharynx.				Hg. 12 injections. Complete recovery.
19. ANDRAL	M. Symptoms of phthisis and gastritis; frequent cough, hoarseness, dyspnea, anorexia, pain in epigastrium, frequent vomiting. Peristaltic pains.	Syphilitic periostitis. Cutaneous pustules.			Hg. by inunction. Recovery.
20. FOURNIER	F. Infected 10 years before. First attack, moribund, profuse hamatemesis, persistent vomiting of blood for 3 or 4 months. Second attack 6 years later. Marked emaciation. Hemorrhages.				1. Recovery on KI rapid. 2. Recovery on KI.
21. FOURNIER	M. Suffered from severe syph. hamatemesis. Desisted in treatment with KI; rupia and hamatemesis, yielding again to KI.				KI with recovery.

CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
22. MURCHISON	M. Syphilis 5 years previously. Nausea, profuse hematemesis, melena, death.		(a). Cirrhotic and nodular liver. Ulcer of stomach in center of which is an open artery.	Gumma of wall of stomach.	Hg. and KI. Recovery.
23. DUBUC	M. Infection 10 years previously. Emaciation, digestion poor; dull pain in epigastrium.	Indurated projection size of pigeon's egg in epigastric region lying in wall of stomach.	(a). Three elevated and infiltrated foci, largest posteriorly and at pyloric. No microscopic examination.		
24. WAGNER	M., 58.			Acute gastritis.	Hg. by inunction. Cure in 2 weeks.
25. HENMETER	F., 11. Congenital. Incessant vomiting and gastralgia.	Huge gumma of lower jaw.		Gastritis.	KI in large doses. Cure in 2 weeks.
26. HENMETER	Child. Congenital. Gastralgia, nausea, emaciation, vomiting.			Syphilitic ulcer.	
27. FLEXNER	M., 52. Ill for 3 years, vomiting, chills following acute alcoholism.	Tumor in splenic region, nearly to umbilicus. Very tender. Ascites. Tapped every 6 to 14 days, 2 to 6 gallons removed.	(a). Syphilitic ulcer. Old adhesions between liver, stomach, spleen and pancreas. Large gumma of liver. Ulcer in stomach shows perforation, base mostly muscularis, edge thick polypoid, firm. Perforation 15 by 3 mm. Micros: Chiefly in submucosa extending into muscularis and less into mucosa.		
28. EINHORN	F., 35. Infection 2 years previously. Gastric symptoms for 6 months. Pain soon after meals. Occasional vomiting. Appetite impaired. Weak. Loss of 20 pounds.	Goose-egg tumor, nodular, hard, under left border of the ribs. Moves with respiration. Gastric region painful to pressure. Test breakfast; F. HCl 0, T. A. 4. Lactic acid 0. Rennin 0. Considerable mucous, mixed with blood.		Syphilitic tumor.	Hg. and KI. Complete cure in several weeks.
29. EINHORN	M., 50. Chancere 20 years ago. Anorexia and insomnia for 18 years. Pain in abdomen for last 3 years. Pain subsided but returned a year later. Persists now 6 months, during which period there has been a loss of 15 lbs. Gained 15 lbs. on KI. Well for about a year, then recurrence with rigidity and vomiting (pyloric). No further history.	Slight oval resistance over an area, size of a hen's egg, in epigastrium. Stomach empty fasting. Test breakfast free HCl positive, T. A. 50.		Syphilitic tumor.	KI temporary recovery.
30. EINHORN	F., 30. Infected 2 years before. Symptoms for 3 months, sharp pain immediately after eating; occasional vomiting, no blood. No result from ulcer treatment. No symptoms when stomach is empty. Nocturnal pain in the tibia.	Area under the ensiform painful to pressure.		Syphilitic ulcer.	KI. Pain less in 14 days. Cure in six weeks.
31. EINHORN	F., 33. Infected 7 years before. Pain right after eating. Hemorrhage (qt.). No cure with ulcer treatment. Pain and another hemorrhage.	Pressure and pain in epigastrium, and under sternum radiating to the back.		Syphilitic ulcer.	NaI. Pain gone in a few days. Recovery.

CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
32. EINHORN	M., 37. Syphilis in 1890. In 1894 severe gastric symptoms. Pain some time after eating. Occa. vomiting. Continued to 1897. Lately worse, vomiting more obstinate. Loss of 30 lbs.	Small, oval, pigeon-egg, tumor rising from under the right border of the ribs extending to pylorus. Greater curvature at symphysis. Test breakfast: F. HCl, T. A. 80. Evidence of retention.		Syphilitic pyloric stenosis.	Nal. Tumor smaller in 14 days, vomiting and retention less. 20 lbs. gain in 4 months.
33. EINHORN	M., 38. Syphilis 18 years before. Well until 3 years ago. Then pain in epigastrium late after eating. Nausea, and occ. vomiting. Lost 30 lbs. with symptoms of stenosis.	Liver enlarged hands-breadth below border, smooth. Greater curvature above umbilicus. F. HCl + T. A. 80. Stomach never empty, even on liquid diet.		Syphilitic pyloric stenosis.	Nal. Distinct improvement of pain and retention in 5 weeks. Total recovery.
34. EINHORN	M., 42. Syphilis 12 years before. Gastric symptoms for 7 years. Frequent pain, appetite poor. Loss of 8 pounds.	A diffuse resistance 5 by 2 cm. with a nodular surface 2 finger-breadth's under ensiform. Lower border stomach 1 finger-breadth under umbilicus. Test breakfast: F. HCl + T. A. 40. No retention.		Syphilitic tumor.	Hg. and Nal. Recovery in 6 weeks.
35. HAYEM	M., 33. Syphilitic orchitis. Sudden profuse gastric hemorrhage.			Syphilitic ulcer.	Lavage, large doses KI. Man now 70 years old. No further symptoms.
36. HAYEM	M., 33. Lues 10 years before. Gastric symptoms, patient pale, emaciated, moderate dilatation, some resistance in neighborhood of gall bladder. Later on treatment a mass in epigastrium.	Test breakfast: F. HCl 0.019 T. A. 0.140		Syphilitic stenosis.	Hg. and KI. Cure.
37. HAYEM	M., 43. No symptoms of syphilis. Constant epigastric pain. Vomiting after eating, no blood. Emaciated, pale almost cachectic. Resistance in gall-bladder region.		Operation and death. A linitis from serosa of pyloro-duodenal region, through to the mucosa. Adhesions to liver and gall-bladder and neighboring organs.	Linitis. Syphilitic Infiltration.	
38. HAYEM	M., 60. Epigastric pain, frequent eructations in 1902. In 1903 appetite good, but loss of 17 lbs. Then vomiting and loss of appetite. No blood. Loss of 25 lbs. Distaste for meat. No tumor. No dilatation.	Test breakfast: F. HCl 0 T. A. 0.284 No lactic acid. No free HCl fasting.	Operation. Fibrous infiltration. Large thickening in duodenal and pyloric regions. Microscopic gummata. Muscular layer infiltrated, spreading to submucosa, forming a marked thickening with the mucosa irregular, villous and in places destroyed.	Syphilitic infiltration.	
39. HAYEM	M., 48. Chancre 25 years previously. No treatment. Pains in epigastrium, pyrosis, vomiting, some emaciation, no blood, no great pallor. Stomach greatly dilated, symptoms of marked retention, sarcine. Progressive impairment with great pain and frequent emesis.	Test breakfast: F. HCl 0.075 T. A. 0.216 Myosis. No knee reflexes.		Syphilitic ulcer.	Inunctions and KI. Cure in 47 days.
40. ROSANOW	M. No signs of lues. Symptoms of ulcer for 8 years. Cardalgia. Pains in legs. Ulcer treatment for 2 months with no result.			Syphilitic ulcer.	

CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
41. LAFLEUR	M., 39. Treated for syphilis. Indigestion, diarrhea, flatulency, fulness, gnawing at all times, worse after food. No definite pain, appetite good. Occasional vomiting. Meat best borne. Loss of 30 lbs. Usual treatment, with no result.	No HCl, no organic acids, no pepsin. Dilated and ptotic stomach. Undigested food and small flakes of mucus, occasionally flecked with minute bloody points.	Operation. *Thick band of adhesions between ant. wall and ant. abdominal wall. Stomach adherent above, below and behind. Pylorus free. Stomach incised; shows denudation of mucosa two and one-half inches from pylorus, entire circumference denuded. Also in ant. part of the stomach for 4 inches towards the cardia.	Thickening and certain degree of hour glass contraction.	
42. LENZMAN	Veneral history admitted. Pain almost always on eating. Frequent hemorrhages. Pain on pressure. Marked emaciation. Diagnosis of ulcer. No result of treatment. Finally gastro-enterostomy. No effect. Finally scar suspicious of syphilis found in pharynx.	Test breakfast: F. HCl 70 T. A. 100		Ulcerated gumma or ulcer.	KI. and Hg. inunctions.
43. LENZMAN	F., 32. Infected when 17. For last one and one-half years pain after eating, hyperacidity. Pain in epigastrium. Treatment for ulcer with no effect.	Paresis of left levator; severe headache, especially nights. Swelling on head.		Gummatous infiltration.	KI. and Hg. Slow recovery.
44. LUXEMBURG & ZAWADZKI	Frequent hemorrhages. Death.		(a). Large indurated ulcer.	Syphilitic ulcer.	
45. HOOVER	F., 40. Syphilis 16 years before. Severe pain one-half hour after eating. Symptoms of hyperacidity with supersecretion. Pain and cructations nights. No tenderness or tumor.	HCl present in the stomach contents.			KI. Relief. Symptoms return on stopping. Further use and relief.
46. HOOVER	M., 50. Syphilis probably 20 years previous. Wife died of condition diagnosed as cancer. All ingested food vomited for last 6 weeks. Constant epigastric pain. Emaciation. Very anemic. No tenderness.	No evidence of retention; no dilatation.			KI. Improvement in 6 wks.
47. HOOVER	M., 48. Syphilis 20 years before. Epigastric pain, constant nausea, frequent vomiting of food and green liquid, for 2 months. Marked emaciation and weakness. No tenderness or tumor.	Greatly dilated stomach. Peristalsis visible. No HCl in green liquid.		Pyloric stenosis.	KI. Restored to health in 3 months.
48. KIRSCH	M., 48. History of lues; died of symptoms of arterio-sclerosis and aortic insufficiency. Few days before death repeated vomiting of small quantities of blood. Diagnosis was hemorrhagic erosions possibly from atheroma of gastric arteries.		Autopsy. Multiple gummata along lesser curvature. No erosions, 2 ulcers, one necrotic. A third near cardia. Mucosa infiltrated, nodular from beneath. Leukoplasic appearance in esophagus near cardia. Small cell infiltration in submucosa extending to muscularis. No spirochete pallida with Levaditi method.	Multiple gummata and ulcers.	
49. MÜLLER	M., 39. History of gonorrhoea and lues.			Sclerosing gastritis.	KI. and Hg. with improvement.
50. JULLIEN	B., 32. Pain in hepato-pyloric region. Lues 10 years previously.	Gastric dilatation, hypochlorhydria.		Gumma or infiltration.	

CASE.	HISTORY OF PATIENT.	PHYSICAL FINDINGS.	(a) AUTOPSY. (b) OPERATION.	GASTRIC DIAGNOSIS.	TREATMENT.
51. GROSS	F., 52. No symptoms of lues. 14 years before suffered from ulcer of the stomach presumably; was treated and cured. One copious hemorrhage. Pain in pelvis. Loss of appetite, emaciation. Then severe pains in epigastrium.	Very pale. Moderate dilatation. No free HCl. Firm resistance over pylorus. Fist-like tumor to right of umbilicus, intestinal in origin.	Operation shows fibrous sclerotic peritonitis. Liver, stomach, and intestine show white, radiating plaques. Pylorus, gall-bladder, duodenum and transverse colon adherent. Fibrous tissue of pylorus especially in submucosa, in the middle of pylorus, 1 cm. thick on cross section. No tuberculosis. No neoplasia. Absolute integrity of mucosa.	Hypertrophic stenosing submucous sclerosis. Fibrous peritonitis.	
52. GROSS	M. Lues, tuberculosis, cholelithiasis. Symptoms of pyloric stenosis, with final complete stenosis.	HCl present.	Autopsy. Fibrous structure 6 by 8 mm. long in pars prapylorica, ½ cm. thick; another at entrance to appendix, the wall thickened 10 times at this point. Another 4 cm. long at flexure flexalis. Tissue shows richly cellular formation. Parietal and visceral peritoneum beset with whitish infiltrations showing radiations.	Pyloric sclerosis. Fibrous peritonitis.	
53. HEMMETER & STOKES	M., 24. Lues 2 years before. Alcoholic, treated by inunctions. Dyspepsia for one or more years. Vomiting. At first liquids retained, but later not.	Test breakfast: F. HCl 0 Combined HCl 0 No ferments.	Operation. A small thick stomach with a hard tumor on greater curvature near pylorus.	Chronic hypertrophic gastritis.	
54. MORGAN	M. Lues, gastric symptoms for 4 years, worse in past few months, steady pain in epigastrium, not influenced by eating or drinking, worse at night, as if was an orange in epigastrium. Distaste for animal food. Loss 35 lbs. in 18 months. Weak, anæmic.	Epigastrium sensitive, no local tenderness, no palpable tumor. Splashing 1½ in. under umbilicus. No free or comb. HCl. No ferments, no blood. Much mucous, slight retention. Diagnosis of carcin. More emaciation. Tumor in pyloric region. Final confirmation of lues.		Syphilitic tumor (Pyloric).	KI. and Hg. Quick recovery. Loss of pain; gain of 10 lbs. Appetite good in less than a month.
55. RUDNITZKI	M., 54. Small ulcer in youth. Gastric distress for 4 years. Worse for last 3. Greatly emaciated. Epigastrium very tender. Loss of 15 lbs. in 2 months. Fine rales in upper right lobe.	Tumor mass from left hypogastrium to 8th-9th rib on right side. Liver 2 cm. below ribs in mammary line.		Gummatous infiltration.	KI. Improvement in 3 days, subs. and obj. Less tender. Rales gone. Tumor finally gone, but resistance remains.
56. RUDNITZKI	M., 47. Symptoms of lues 18 or 19 years ago. Pain immediately after eating, lasts 2 or 3 hours. No blood.	Area under xyphoid very tender. Liver not palpable. Reflexes increased. Paræsthesie. Pupils wide, react poorly to light. No stomach contents.			Hg. and KI. Sarsaparilla. Slow recovery. Injections of KI badly borne. Slight residual pain.
57. MYER	M., 32. Pain after eating for 2 hours. Loss of weight. No melæna. Ulcer treatment with further loss of 30 lbs.	Lower border 2 fingers under umbilicus; pain on pressure deep in middle line of epigastrium. No tubercle bacilli in sputum. No HCl. No blood. No lactic acid bacilli and no sarcine in stomach contents. Diagnosis: Chronic ulcer (Car. degenerat?). In three months a palpable mass in epigastrium and retention.	Trace of lactic acid. Gastro-enterostomy done. Afterward discovery of ancient lues.	Syphilitic tumor (Pyloric).	KI. Recovery. No retention. No HCl in stomach, with recovery about 9 months later.
58. SIEGHEIM	M., 39. Lues 18 years before. Many cures. Copious vomiting, progressive emaciation.	Stomach contents. No HCl; retention. Blood in stool. Slight visible peristalsis. Indefinite resistance in pyloric region. Fast-ing stomach contains 250 cc. No HCl; lactic acid positive. Fluoroscopic shows pyloric stenosis. Wassermann strongly positive.		Pyloric stenosis.	KI. Little retention. HCl. Lactic acid.

RADIOGRAPHS OF THE ARGYROL OR COLLARGOL INJECTED URINARY TRACT.*

By HENRY DAWSON FURNISS, M.D.,

NEW YORK CITY.

THE term pyelography was applied by Voelker, who originated this diagnostic method, to radiography of the urinary tract after its injection with a medium denser than the surrounding structures. Of late the use of a less dense substance, such as oxygen or air, has been used in some cases, but on the whole this is not as satisfactory. Besides poorer differentiation of shadow, it is impossible to displace all the fluid in the urinary tract, and this prevents getting a correct outline of the injected organs.

Döderlein and Krönig report using Xeroform in Albolene. With this beautiful pictures are obtained, but the disadvantages are that the mixture is thick, hard to inject, and what is more to the point, harder to drain from the pelvis of the kidney. Xeroform is not soluble in water, and it is possible that portions left may form the nucleus of a stone.

Argyrol, 10 to 50 per cent., and collargol, 5 to 25 per cent., are the substances most generally used. These solutions readily mix with any urine that may not have been drained from the kidney pelvis or ureter, and with them we are able to obtain radiographs showing the outlines of the entire renal pelvis and ureter. With collargol, the limit of solubility in water is 5 per cent., but mixtures containing as high as 25 per cent. of the collargol can be used. Argyrol contains 20 to 25 per cent. silver, and collargol 87 per cent. Dr. Braasch claims that there is less pain if the collargol is finely divided before mixing it with the water.

Pyelography is one of the most valuable diagnostic methods we have in the study of diseases of the urinary tract, and it has cleared for us many obscure cases in which we could not have otherwise made more than a probable diagnosis. In cases of stone that has been lodged in the ureter at any point for any length of time there is always a dilatation of the ureter above it. Here we obtain the relation of the shadow suspected to be that of a stone, the relation of it to the ureter, and the dilatation above. In the cases of floating kidney with symptoms of renal pain, we have nearly always found some dilatation of the renal pelvis. In such cases, Dr. O. S. Fowler of Denver, has radiographed them in the recumbent posture, and afterwards standing; this shows not only the degree of dilatation of the renal pelvis, but also the limit of mobility of the kidney and any produced kinking of the ureter.

In renal tumors, encroaching upon the kidney pelvis, the amount and degree of distortion

is graphically depicted. This is of great differential diagnostic importance in the diagnosis of abdominal tumors; we found it of aid in the case of a large hypernephroma of the kidney. In the case reported through the courtesy of Dr. Arthur Stein, he was able to determine definitely in this manner that a growth lying just above the brim of the pelvis on the left side was a fused dystopic kidney.

During the past two years I have seen five cases of three ureters and one of four. In the case of four ureters we obtained radiographs showing that the ureters ran to separate pelvises. By passing catheters to both ureters of one kidney and first injecting the proximal, or abnormally situated ureter, we were able to see that this ran to the upper pole of the kidney, and that there was no connection between the two pelvises.

The method has been of most use in the determination of strictures, of both the upper and lower ends of the ureters. We have as yet found none in the middle, or intermediate portion. We have had several cases of obstruction of the ureter near the pelvis of the kidney; and it has been interesting to note the form in which the dilatation of the pelvis takes place. It occurs in a forward and downward direction. In the first stages the ureter has the appearance of coming off from the pelvis at a right angle; as the dilatation progress (downwards and forwards, the ureter remaining fixed) we get the appearance of a high insertion of the ureter, and the formation of a spur. This spur may later act as a valve, the pressure of the urine in the dilated pelvis shoving it inwards and obstructing the ureter as it leaves the pelvis. We have a case of dilatation of the ureters following a severe cystitis, in which there is also seen a dilatation of the renal pelvis, with the high insertion of the ureter.

We have two cases of stricture at the vesical end of the ureter. Both of these had been operated upon by most competent surgeons with no relief. One for gall bladder, the other for appendicitis and afterwards for gall bladder. In both of these the obstruction at the vesical end with the consequent dilatation of the ureter and kidney pelvis was beautifully seen. In neither one was there felt any resistance to the passage of a No. 5 ureteral catheter. The first one was discovered more or less accidentally. She had had a previous radiographic examination, and the plate of the pelvis showed a number of shadows. To determine if these had any relation to the ureter, the ureter was injected with collargol and then a radiograph made. We were rather surprised to see so well the stricture. The second was suspected.

Nearly all of this work has been done with Dr. Leopold Jaches, and whatever success has been obtained is largely due to his ability and painstaking care. The technic that we have developed is as follows: The patient the night before takes

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

one and a half ounces of castor oil, and the next morning only some tea or coffee and broth. She first has radiographs made of the entire urinary tract before any argyrol or collargol injections are made. This to determine the presence or absence of stones, or shadows suspicious of stone. The ureter on the suspected side is then catheterized to the renal pelvis, either through a water dilating cystoscope or a Kelly tube. If a water dilating cystoscope is used we have left it in place in the bladder to prevent disturbing the position of the ureteral catheter. The patient is put in position, the cystoscope held stationary by a towel between the legs, or by a regular cystoscope holder, the compression diaphragm adjusted over the area to be radiographed (this determined at first by the history and physical findings), and then the solution (25 to 50 per cent. argyrol or 10 to 25 per cent. collargol) slowly injected into the ureter through the catheter. We have used a 20 cc. Record syringe, as the tip of this fits nicely the pavillion on the ureteral catheters. The patient's face is watched for the first sign of pain, and the injection discontinued or slowed when pain is caused. We have preferred a small catheter around which the solution could escape into the bladder rather than a large one that blocked the kidney pelvis, feeling that we in this way caused less pain and ran less risk of damage. After two or three minutes (this being allowed to permit the thorough mixing of any urine remaining in the kidney pelvis with the solution), a signal is given to the radiographer to make the exposure. During this time the solution is slowly injected, for we found that if we made the injection, waited an appreciable time, and then radiographed, most of the solution would be expelled from the pelvis.

After the exposure the syringe is disconnected from the catheter, and the solution allowed to drain away. We have left the catheter in place until the radiograph is developed, for it may be necessary to make other radiographs owing to failure of the first, or because we wished to show up some other part of the urinary tract. Should we detect that the ureter and the kidney pelvis is dilated in a plate showing the upper urinary tract, we can infer that there is some obstruction at a point below.

In a number of patients we have caused marked pain, and we believe that this is due to the mechanical distention. Normal cases have had very little pain. In two instances where there was marked distention of the whole ureter, and of course no obstruction to the return of the solution, there was absolutely no sensation at all in the kidney or the ureter; these we feel bear out our contention that the pain is due to mechanical distention. The most severe pain has been in those with urethral obstruction, and in the ones who had had the most severe attacks before the examination. Thinking that perhaps the solution might cause some swelling of the ureteral

mucosa and that this might add to the obstruction we injected both before and after the argyrol adrenalin, but this seemed to make no difference. Nor were we able to see that alypin, 5 per cent., injected had any effect on the pain.

Even, in spite of the discomfort that sometimes attends this, we believe that it is a method of the greatest usefulness, and one that cannot be supplanted by any other at present known. Its exactness will appeal strongly.

Discussion.

E. MACD. STANTON.—I have been greatly interested in what Dr. Furniss has shown us this afternoon. Three years ago I had the good fortune to be in Rochester when Dr. Braasch read his first communication concerning pyelography. Ever since that time I have made routine use of the method whenever the X-ray or the cystoscope alone could not clear up the diagnosis. We have come to look upon it as the most valuable single diagnostic procedure which we have at our command for the diagnosis of lesions of the upper urinary tract—and the diagnosis of surgical lesions of the kidney and ureter is now the most accurate branch of abdominal diagnosis.

By noting the lower limit of the hydro-ureter or hydronephrosis as shown by the collargol plate we know exactly the site of the obstruction which limits greatly the necessity of exploration at the time of operation. The surgeon can go directly to the site of trouble with the least possible operative trauma.

Dr. Furniss has mentioned the fact that a large proportion of his patients had been previously operated under an incorrect diagnosis. In analysing the histories of patients operated by Dr. McMullen and myself for surgical lesions of the kidney and ureter I find that one-third of our patients had been previously operated elsewhere with the removal of the appendix or an ovary or possibly the drainage of some bile, but with no improvement in their symptoms. Another third of our patients had suffered for from 3 to 22 years without a correct diagnosis being made. In the one-third which came to operation within what may be considered a reasonable time, the symptoms were so severe and so definite that the patients themselves for the most part demanded operative relief.

CORRESPONDENCE.

July 30, 1912.

A. T. Bristow, M.D., Editor,

DEAR SIR:—I am sorry to see that you and the Committee on Publication have not endorsed such a good editorial as Dr. Brady had in the June number of the Journal.

It has pleased me to note that the Journal has been progressive enough to discuss economic subjects. It is what we need, so let us have more along this line.

Yours respectfully,

CHARLES HAASE,

Central Islip, L. I.

August 6, 1912.

Dr. A. T. Bristow, Editor, New York.

DEAR DOCTOR:—I have read Dr. Brady's article in the June number of the Journal with a great deal of interest and approval. It seems to me that he has the correct idea in regard to the matter of the fee bill.

Very truly yours,

JOHN J. HARRINGTON.

Central Islip, N. Y.

August 6, 1912.

Dr. A. T. Bristow, Editor.

DEAR DOCTOR:—I read with great interest Dr. Brady's article in the June number on Economics. Although I agree with him, I would be glad to see further discussion, as the subject is certainly a timely one.

Very truly yours,

CHARLES L. VAUX.

*A. T. Bristow, M.D.,**Editor N. Y. State Journal of Medicine,
New York City.*

DEAR DOCTOR:—I would like to say a few words in reply to Dr. Beverley Robinson's letter that appeared in the August number of the State Journal.

The doctor is classing us with the "Quacks" when he says, "To every physician who has the nobility of his profession at heart, the sending of a bill for services to a patient is always somewhat of a regret. Even in those instances when he knows that the check for the same will come by return mail, he has his qualms." That is my idea of how a quack must feel.

When we perform conscientious and thorough work, our patients who are able should pay us a just fee.

I could not practise medicine if I regretted it every time I sent a statement or had qualms when I received a check.

Yours fraternally,

CHARLES HAASE, M.D.

Elmira, N. Y.

August 24, 1912.

The Medical Society of the State of New York

DISTRICT BRANCHES.

FIRST DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, POUGHKEEPSIE, N. Y., FRIDAY.

OCTOBER 4, 1912.

PRELIMINARY PROGRAM.

President's Address, Daniel Bailey Hardenbergh, M.D., Middletown.

"The Owen Bill," Hon. Richard E. Connell, House of Representatives, Washington, D. C.

"Functional Nervous Diseases Due to Eye Strain," Peter A. Callan, M.D., New York.

"Progressive Curvature of the Radius (Madelung's Deformity)," Henry Ling Taylor, M.D., New York.

"Pyloric Stenosis in Infancy," Charles Gilmore Kerley, M.D., New York.

"A Consideration of Diet in Acute Diseases," W. Stanton Gleason, M.D., Newburgh.

Urgent Surgery in Association with Uterine Fibroids," James E. Sadlier, M.D., Poughkeepsie.

"The Present Status of Medical Therapeutics," Andrew Victor Jova, M.D., Newburgh.

"The Relation of Prolonged Pregnancies to Some Cerebral Lesions and to Backward Mental States," Henry Lyle Winter, M.D., Cornwall.

"City Sanitation," William Sheldon Coons, M.D., Yonkers.

"The Old Method of Treatment of Syphilis, Versus the New," Mihran B. Parounagian, M.D., New York.

Gall Stones," Parker Syms, M.D., New York.

SECOND DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, MINEOLA, WEDNESDAY EVENING,
OCTOBER 2, 1912.

PRELIMINARY PROGRAM.

Election of Officers.

SCIENTIFIC SESSION.

Henry Albert Wade, M.D., Brooklyn.

Henry Mead Warner, M.D., Hempstead.

President's Address on the Medical Society of the State of New York and its Constituent Societies, Walter B. Chase, M.D., Brooklyn.

Title to be announced, John F. W. Whitbeck, M.D., President of the Medical Society of the State of New York, Rochester.

Presidents of the four County Societies constituting the Second District Branch will participate in the Scientific Session or in the social entertainment tendered by the Queens-Nassau Medical Society.

THIRD DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, TROY, N. Y., TUESDAY.

OCTOBER 1, 1912.

PRELIMINARY PROGRAM.

President's Address, John Bruce Harvey, M.D., Troy.

"Some Observations in the Surgical Treatment of Cholecystitis," Mark O'Meara, M.D., Kingston.

"Some Remarks on the Code of Ethics," Robert Selden, M.D., Catskill.

"A Clinical Study of the Practical Value of Auto-inoculation in the Treatment of Pulmonary Tuberculosis," Pret de Bloeme, M.D., Loomis Sanatorium, Liberty.

"The Clinical and Pathological Study of a Case of Primary Malignant Disease of the Pleura," H. J. Bernstein, M.D., Bender Laboratory, Albany.

"Spontaneous Fracture as an Early Symptom of Tabes Dorsalis," Henry Ling Taylor, M.D., New York.

"Common Errors in the Diagnosis of Diseases of the Joints," Wisner Robinson Townsend, M.D., New York.

"Carcinoma of the Rectum," Sherwood Volkert Whitbeck, M.D., Hudson.

"The Significance of Dyspepsia," John Francis McGarrahan, M.D., Cohoes.

"The Report of a Rare Case of Exfoliation of the Cornea Corresponding to Dermatitis Exfoliativa," Clark Green Rossman, M.D., Hudson.

Title to be announced, J. Montgomery Mosher, M.D., Albany.

ANNOUNCEMENT.

The forenoon will be given up to the Clinics at the different hospitals.

FOURTH DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, GLENS FALLS, TUESDAY, OCTOBER 8,
1912.

Preliminary Program.

President's Address, Fred Gershom Fielding, M.D., Glens Falls.

Address, Abraham Jacobi, M.D., President American Medical Association, New York.

Address, Heinrich Stern, M.D., New York.

"Surgical Treatment of Goitre," James P. Marsh, M.D., Troy.

"Aphasia," John M. Griffin, M.D., Warrensburgh.

"Differential Diagnosis of Pulmonary Tuberculosis," Henry S. Goodall, M.D., Lake Kuskaqua.

"Importance of Pulmonary Rest in the Treatment of Pulmonary Tuberculosis," Lawrason Brown, M.D., Saranac Lake.

"Epileptic Equivalents Influenced by Nose and Throat Work," Walter S. Daly, M.D., Ogdensburgh.

"Accidents of Hernia Operations," Dudley S. Kathan, M.D., Schenectady.

"Some Observation on Pancreatic Surgery," Charles G. McMullen, M.D., Schenectady.

"Diagnosis and Treatment of Appendicitis," William J. Hunt, M.D., Glens Falls.

"Present Status of Diabetes and Its Treatment," Roy Munro Collie, M.D., Schenectady.

"Antitetanic Serum Therapy," George Scott Towne, M.D., Saratoga Springs.

"Use and Abuse of Nitroglycerine," William Leslie Munson, M.D., Granville.

"Neglect of Laboratory Aids to Diagnosis," David Wilson, M.D., Amsterdam.

"Lleus," George Foster Comstock, M.D., Saratoga Springs.

"Macular Inflammation," John J. O'Brien, M.D., Schenectady.

There will be an intermission at noon for lunch at the Parish House.

FIFTH DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, OSWEGO, N. Y., THURSDAY,

OCTOBER 3, 1912.

PRELIMINARY PROGRAM.

President's Address, James K. Stockwell, M.D., Oswego.

"Nasal Obstruction and the Value of Submucous Resection for Its Relief," James Francis McCaw, M.D., Watertown.

"Perforated Duodenal Ulcer, Diagnosis and Treatment," Nathan Jacobson, M.D., Syracuse.

"The Saccharomyces," Walter H. Kidder, M.D., Oswego.

"Increasing the Factors of Safety in Surgical Operations," Jonathan M. Wainwright, M.D., Scranton, Pa.

"Abnormal Temperatures," Martin Cavana, M.D., Sylvan Beach.

"Ether Anesthesia," Clifford R. Hervey, M.D., Oswego.

Discussion by E. P. Bailey, M.D., Oneida, and John Buettner, M.D., Syracuse.

"Some Lesions of the Lumbar and Sacro Spines," Charles Hume Baldwin, M.D., Utica.

Discussion opened by Clarence E. Coon, M.D., Syracuse.

"Goitre," Walter Lathrop, M.D., Hazleton, Pa.

"Renal Hematuria," Henry L. Elsner, M.D., Syracuse.

"Blood Pressure," Augustus B. Santry, M.D., Little Falls.

"Medical Reciprocity," John W. LeSeur, M.D., Batavia.

"Lessons from a Case of Tonsil and Adenoid Operation," Thomas Henry Farrell, M.D., Utica.

Adjournment for luncheon.

"Poliomyelitis—Epidemic at Red Creek, N. Y., 1909-10," Charles G. Plumb, M.D., Red Creek.

"Acute Perforating Gastric and Duodenal Ulcers," Gilbert David Gregor, M.D., Watertown.

"The Possible Effect of Infected Streams on Milk Supply," Fred L. Meader, M.D., Syracuse.

Discussion by David M. Totman, M.D.

"Immuno-therapy in Ophthalmology and Otolaryngology," R. L. Crockett, M.D., Oneida.

"The Physician's Relation to the Public Health Authorities," Charles E. Low, M.D., Pulaski.

"Blood Platelets," James W. W. Dimon, M.D., Utica.

"Pathology and Treatment of Chronic Urethritis in the Male," Joseph Day Olin, M.D., Watertown.

"Landry's Paralysis with Report of a Case," Hyzer William Jones, M.D., Utica.

ANNOUNCEMENT.

The members of the Fifth District Branch, and all attending physicians, are invited to be the guests of the members of the Medical Society of the County of Oswego for luncheon, at the Pontiac, at 1 o'clock.

Committee:

- A. C. CALISCH, *Chairman*,
- F. E. MACCALLUM,
- W. C. TODT,
- F. E. FOX.

SIXTH DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, BINGHAMTON, N. Y., TUESDAY,

OCTOBER 15, 1912.

PRELIMINARY PROGRAM.

Subject to be announced, Albert E. Roussel, M.D., Phila., Pa.

Discussion to be announced later.
"Control of Venereal Diseases," Paul B. Brooks, M.D., Norwich.

Discussion opened by William A. Howe, M.D., Deputy Commissioner of Health, New York State.

"A Plea for Early Diagnosis in Surgical Affections," Alvah H. Traver, M.D., Albany.

Discussion to be announced later.
"An Analysis of Shock," Arthur S. Chittenden, M.D., Binghamton.

Discussion opened by Stuart B. Blakely, M.D., Binghamton.

"Immunity and Vaccine Therapy," Arthur W. Booth, M.D., Elmira.

Discussion to be announced later.
"Tubercular Lymph Glands from a Surgical Standpoint," Martin B. Tinker, M.D., Ithaca.

Discussion to be announced later.
"Examination of the Insane," Theodore I. Townsend, M.D., Binghamton.

Discussion to be announced later.

ANNOUNCEMENT.

The visiting physicians and their wives will be the guests of the Broome County Medical Society, who will supply refreshment and entertainment in the way of automobile rides around the city.

SEVENTH DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, CORNING, THURSDAY,

OCTOBER 10, 1912.

PRELIMINARY PROGRAM.

President's Address, Herbert B. Smith, M.D., Corning.

"The Cancer Problem," LaRue Colgrove, M.D., Elmira.

"Fractured Femur with New Apparatus for Traction," Edgar Sturge, M.D., Scranton, Pa.

"Prevention of Joint Deformities and Cure of Crippled Arms and Legs," William B. Jones, M.D., Rochester.

"Bacterine Therapy," William I. Dean, M.D., Lyons, "Inflammation of Nasal Accessory Sinuses," T. Joseph O'Connell, M.D., Rochester.

"Means and Methods of Eliminating the Death Rate from Surgical Operations," Marshall Clinton, M.D., Buffalo.

"Loose Abdominal Viscera," Robert Tuttle Morris, M.D., New York.

"Ruptured Tubal Pregnancies," William W. Skinner, M.D., Geneva.

"Uterus Duplex cum Vagina Duplex Separata," Lawrence George Hanley, M.D., Buffalo.

"The Diagnostic Value of Blood Examinations," John Mumford Swan, M.D., Rochester.

"The Prevention of Insanity," Chester Waterman, M.D., Willard.

"Diet in Undernutrition," Charles R. Witherspoon, M.D., Rochester.

"Fracture of the Patella," Thomas Forrest Laurie, M.D., Auburn.

ANNOUNCEMENT.

The physicians will be the guests of the Corning Medical Association at luncheon at 1 P. M.

EIGHTH DISTRICT BRANCH OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK.

ANNUAL MEETING, BUFFALO, TUESDAY AND WEDNESDAY, SEPTEMBER 24 AND 25, 1912.

Preliminary Program.

TUESDAY, SEPTEMBER 24TH, 2 P. M.

BUSINESS MEETING.

President's Address, Henry A. Eastman, M.D., Jamestown.

"Remarks on Some of the Needs of the State Society," John F. W. Whitbeck, M.D., President Medical Society of the State of New York, Rochester.

"Early Diagnosis of Cancer of the Intestines," Frederick Herbert Nichols, M.D., Jamestown.

Discussion to be opened by Thomas H. McKee, M.D., Buffalo.

"Plaster of Paris as a Surgical Dressing," H. F. Gillette, M.D., Cuba

Dinner at the University Club at 7 P. M.

September 25th, 9 A. M.

Ambulatory Clinic—Grover W. Wende, M.D.; Henry C. Buswell, M.D.; Edward J. Meyer, M.D.; Herbert A. Smith, M.D.; Edward A. Sharpe, M.D.; Lesser Kauffman, M.D.

11.30 A. M.

Surgical Clinic Buffalo General Hospital, Roswell Park, M.D.

Luncheon.

2 P. M.

"Einhorn's Bead Test as a Means of Estimating Intestinal Digestion," William Gerry Morgan, M.D., Washington, D. C.

"Gastro-Intestinal Atony," Allen Arthur Jones, M.D., Buffalo.

COUNTY SOCIETIES

MEDICAL SOCIETY OF THE COUNTY OF GREENE.

REGULAR MEETING, JULY 9, 1912.

SCIENTIFIC PROGRAM.

Annual Address of the Vice-President, R. H. Van Denburg, M.D., Coxsackie.

"Caesarean Section Under Spinal Anesthesia for Eclampsia, with Report of Three Cases," J. P. Marsh, M.D., Troy.

SCHOHARIE COUNTY MEDICAL SOCIETY.

SEMI-ANNUAL MEETING, AT SHARON SPRINGS, JUNE 20, 1912.

SCIENTIFIC SESSION.

A Symposium of the Waters and Baths of Sharon Springs, N. Y.

1. "History and Physical Features," H. L. Odell, M.D., Sharon Springs.

2. "Therapeutic Application of the Waters of the White Sulphur Spring," L. O. White, M.D., Sharon Springs.

3. "Therapeutic Application of the Waters of the Magnesia Spring," I. C. Goldstein, M.D., Sharon Springs.

4. Dinner at 12.30 P. M.

5. Inspection of Baths.

6. "The Waters and Baths of Europe," Andrew MacFarlane, M.D., Albany.

BROOME COUNTY MEDICAL SOCIETY.

QUARTERLY MEETING, AT BINGHAMTON, JULY 2, 1912.

SCIENTIFIC SESSION.

"Report of a Case of Pernicious Anæmia Treated with Salvarsan," Mary Ross, M.D., Binghamton.

"Esophageal Strictures," L. H. Quackenbush, M.D., Binghamton.

"Report of a Case of Scurvy," H. I. Johnston, M.D., Binghamton.

"Tetanus," G. S. Lape, M.D., Binghamton.

"Report of a Case," A. T. Chittenden, M.D., Binghamton.

MEDICAL SOCIETY OF THE COUNTY OF ONEIDA.

SEMI-ANNUAL MEETING, AT UTICA, JULY 9, 1912.

SCIENTIFIC SESSION.

"The Practical Application of Some Recent Research into the Nature, Cause and Treatment of Meningitis," S. J. Kopetzky, M.D., New York City. (

Discussion opened by Drs. J. D. Jones, F. R. Ford, J. E. Haight and W. C. Gibson.

MADISON COUNTY MEDICAL SOCIETY.

SYLVAN BEACH, AUGUST 6, 1912.

The summer outing meeting of the Madison County Medical Society, attended by members and their wives, occurred at Sylvan Beach, August 6th. Forty-eight sat down to dinner and the party was entertained by Dr. Martin Cavana, of Sylvan Beach, a member of the Society. The meeting was largely a social event and a motor-boat ride on Oneida Lake was given to the ladies of the party. At the business meeting Dr. Charles H. Glidden, of Little Falls, a medical officer of the State Department of Health, addressed the Society, on "The Summer Diarrhea of Infants and Its Prevention."

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

TUBERCULIN TREATMENT. By Clive Riviere, M.D., Lond.; F.R.C.P. Physician, East London Hospital for Children, Shadwell; Physician to Outpatients, City of London Hospital for Diseases of the Chest, Victoria Park, and Egbert Morland, M.B. and B.Sc., Lond.; M.D., Berne of Arose, Switzerland; Visiting Physician to the English Sanatorium (Villa Gentiana). London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912. Price, \$2.

- GONOCOCCAL INFECTIONS.** By Major C. E. Pollock, Royal Army Medical Corps, and Major L. W. Harrison, Royal Army Medical Corps. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912. Price, \$2.
- TEXT-BOOK FOR NURSES.** Anatomy, Physiology, Surgery and Medicine. By E. W. Hey Groves, M.S., F.R.C.S., Assistant Surgeon, Bristol General Hospital; Clinical Lecturer, University of Bristol, and J. M. Fortescue-Brickdale, M.A., M.D., Assistant Physician, Bristol Royal Infirmary; Clinical Lecturer, University of Bristol. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912.
- STOMATOLOGY IN GENERAL PRACTICE.** A text-book of diseases of the teeth and mouth for students and practitioners, by H. P. Pickerill, M.D., Ch.B., M.D.S. (Birm.); L.D.S. (Eng.); Hon. Stomatologist to the General Hospital; Dunedin Professor of Dentistry and Director of the Dental School in the University of Otago; Hon. Consulting Dental Surgeon to the Pleasant Valley Sanatorium. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912.
- INTERNATIONAL CLINICS.** A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, U. S. A., with the collaboration of Wm. Osler, M.D., Oxford; A. McPhedran, M.D., Toronto; Frank Billings, M.D., Chicago; Chas. H. Mayo, M.D., Rochester; Thos. H. Rotch, M.D., Boston, etc. With regular correspondents in Montreal, London, Paris, Berlin, Vienna, Leipsic, Brussels and Carlsbad. Volume II, 22d Series, 1912. Philadelphia and London. J. B. Lippincott Company. 1912. Price, \$2.
- HYGIENIC LABORATORY.** Bulletin No. 84, May, 1912. **DIGEST OF COMMENTS ON THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA** (Eighth Decennial Revision), and on the **NATIONAL FORMULARY** (Third Edition), for the calendar year ending December 31, 1910. By Murray Galt Motter and Martin I. Wilbert. Washington. Government Printing Office, 1912.
- THE CARE OF THE SKIN IN HEALTH.** By W. Allan Jamieson, M.D., F.R.C.P.E., Knight of Grace of St. John of Jerusalem; Surgeon, the Kings' Bodyguard for Scotland, the Royal Company of Archers; Consulting Physician for Diseases of the Skin, Edinburgh Royal Infirmary. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912. Price, \$1.00.
- CHILDREN—THEIR CARE AND MANAGEMENT.** By E. M. Brockbank, M.D. (Vict.); F.R.C.P., Honorary Physician, Royal Infirmary, Manchester. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912.
- MANUAL OF SURGERY.** By Alexis Thomson, F.R.C.S., Ed. Professor of Surgery, University of Edinburgh; Surgeon Edinburgh Royal Infirmary, and Alexander Miles, F.R.C.S., Ed. Surgeon Edinburgh Royal Infirmary. Volumes II and III. Fourth Edition, revised and enlarged, with 274 illustrations. Edinburgh, Glasgow and London. Henry Frowde and Hodder & Stoughton. 1912.
- COMPENDIUM OF DISEASES OF THE SKIN.** Based on an analysis of thirty thousand consecutive cases with a therapeutic formulary. By L. Duncan Bulkley, A.M., M.D., Physician to The New York Skin and Cancer Hospital; Consulting Physician to The New York Hospital; Consulting Dermatologist to The Randall's Island Hospital, to The Hospital for Ruptured and Crippled, and to The Manhattan Eye and Ear Hospital, etc. Fifth revised edition of The Manual of Diseases of the Skin. Paul B. Hoeber, 69 East 59th Street, New York. 1912. Price \$2.00, net.
- A TEXT-BOOK OF PATHOLOGY.** For Students of Medicine. By J. George Adami, M.A., M.D., LL.D., F.R.S., Professor of Pathology in McGill University, Montreal, and John McCrae, M.D., M.R.C.P., (London), Lecturer in Pathology and Clinical Medicine in McGill University, formerly Professor of Pathology in the University of Vermont. In one octavo volume of 759 pages, with 304 engravings and 11 colored plates. Cloth, \$5.00, net. Lea & Febiger, Philadelphia and New York, 1912.
- PHARMACOLOGY AND THERAPEUTICS FOR STUDENTS AND PRACTITIONERS OF MEDICINE.** By Horatio C. Wood, Jr., M.D., Professor of Pharmacology and Therapeutics in the Medico-Chirurgical College; Physician to the Medico-Chirurgical Hospital; Second Vice-Chairman of the Committee of Revision of the U. S. Pharmacopœia. Philadelphia and London. J. B. Lippincott Company. Price, \$4.00.
- PRACTICAL ANATOMY.** An exposition of the facts of Gross anatomy from the typographical standpoint and a guide to the dissection of the human body. By John C. Heisler, M.D., Professor of Anatomy in the Medico-Chirurgical College of Philadelphia. With 366 illustrations, of which 225 are in color. By E. F. Faber. Philadelphia and London. J. B. Lippincott Company. Price, \$4.50.
- THE PITUITARY BODY AND ITS DISORDERS.** Clinical states produced by disorders of the hypophysis cerebri. By Harvey Cushing, M.D., Associate Professor of Surgery in the Johns Hopkins University; Professor of Surgery (Elect) Harvard University. An amplification of the Harvey Lecture for December, 1910. 319 illustrations. Philadelphia and London. J. B. Lippincott Company. Price, \$4.00.
- THE MECHANISTIC CONCEPTION OF LIFE.** Biological Essays. By Jacques Loeb, M.D., Ph.D., Sc.D. Member of the Rockefeller Institute for Medical Research. The University of Chicago Press. Chicago, Ill. Price, \$1.50 net. 165 pp.
- PHILADELPHIA GENERAL HOSPITAL REPORTS.** Volume VIII.—1910. Edited by David Reisman, M.D. Philadelphia. Dunlap Printing Co., 1315-29 Cherry Street, 1911.
- AN ESSAY ON HASHEESH** including observations and experiments. By Victor Robinson, Contributing Editor, Medical Review of Reviews, Pharmaceutical Chemist, Columbia University, Member of the American Chemical Society, Author of "Pathfinders in Medicine." Medical Review of Reviews. 206 Broadway, New York. 1912. Price, 50c.
- X-RAY DIAGNOSIS AND TREATMENT.** A text-book for general practitioners and students. By W. J. S. Bythell, B.A., Cantab., M.D., Vict. Hon. physician to the Ancoats Hospital, Manchester (Electro-Therapeutic Department); Medical officer to the X-ray Department of the Manchester Children's Hospital; Medical officer to the X-ray Department of the Salford Royal Hospital, and A. E. Barclay, M.D., Cantab., M.R.C.S., L.R.C.P. Medical officer to the Electrical and X-ray departments, Manchester Royal Infirmary; late clinical assistant to the Electrical department of the London Hospital. London. Henry Frowde. Hodder & Stoughton. Oxford University Press, Warwick Square, E.C. 1912. Price, \$5.50.
- PATHOLOGY OF THE EYE.** By P. H. Adams, M.A., M.B., D.O., Oxon, F.R.C.S. Surgeon to Oxford Eye Hospital; Consulting Ophthalmic Surgeon to the Radcliffe Infirmary. London. Henry Frowde. Oxford University Press. Hodder & Stoughton, Warwick Square, E.C. 1912. Price, \$1.50.

DIGESTION AND METABOLISM. The Physiological and Pathological Chemistry of Nutrition. For students and physicians. By Alonzo Englebort Taylor, M.D., Rush Professor of Physiological Chemistry, University of Pennsylvania, Philadelphia. Octavo, 560 pages. Cloth, \$3.75, net. Lea & Febiger, Philadelphia and New York, 1912.

MATERIA MEDICA AND THERAPEUTICS, including Pharmacy and Pharmacology. By Reynold Webb Wilcox, M.A., M.D., LL.D. Professor of Medicine (Retired) at the New York Post-Graduate Medical School and Hospital; Consulting physician to St. Mark's and to the Nassau Hospitals; President of the Medical Association of the Greater City of New York; President of the Society of Medical Jurisprudence; Ex-President of the American Therapeutic Society and of the Harvard Medical Society; Fellow of the American Academy of Medicine; Honorary member of the Connecticut State Medical Society; Formerly Vice-Chairman of the Revision Committee of the United States Pharmacopœia, etc. Eighth edition, revised, with index of symptoms and diseases. Philadelphia. P. Blakiston's Son & Co., 1012 Walnut Street. 1912. Price, \$3.00.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS, with especial reference to the application of remedial measures to disease and their employment upon a rational basis. By Hobart Amory Hare, M.D., B.Sc., Professor of therapeutics and materia medica in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; one-time clinical professor of diseases of children in the University of Pennsylvania; Laureate of the Royal Academy of Medicine in Belgium, of the Medical Society of London; Member of the Committee of Revision of the United States Pharmacopœia of 1905. Fourteenth edition, enlarged, thoroughly revised, and largely rewritten. Illustrated with 131 engravings and 8 plates. Lea & Febiger. Philadelphia and New York. 1912.

IN MEMORIAM.

MAURICE HOWE RICHARDSON, M.D.

To the Members of the Medical Society of the State of New York:

The death of Dr. Maurice Howe Richardson of Boston, Mass., which suddenly occurred July 31st last, is a personal loss to every member of our Society. Dr. Richardson's name was held in the highest esteem in the State of Massachusetts, but his reputation as a leading surgeon and teacher of surgery was national. You will appreciate the more this great loss to our profession when you know that Dr. Richardson had kindly consented to deliver an address on surgery at the general session of our Society, April 29, 1913. You are thus reminded that Dr. Richardson had a personal interest in our State Society and that his presence on the occasion of our next annual convention will be sadly missed.

JOHN F. W. WHITBECK, President.

WILBUR FISK LAMONT, M.D.

The following memorial to Wilbur Fisk Lamont, M.D., was submitted by a committee appointed by all the physicians of the village of Catskill, August 2nd, 1912.

Wilbur Fisk Lamont, M.D., was born in Richmondville, Schoharie County, July 29, 1863. He

was graduated with honors from Union College, 1886, then took up the study of medicine and graduated from the Albany Medical College in 1889. He began his practice in Catskill and on July 17th, 1890, married Miss Grace Johnson of Durham. He leaves a wife and son, a brother and sister.

In the death of our good Dr. Lamont, the physicians of the Village of Catskill have met with an irreparable loss, and while we wish to express our sincere sympathy with his bereaved family, we wish also to express our full appreciation of his manly virtues. His high professional attainment and the strict fidelity and faithfulness that he always exhibited in the practice of his chosen profession. He was always "the good Physician."

Dr. Lamont's character was of the highest type of manhood. He endeared himself to all who knew him, and to the poor his services were always freely given. Among his professional friends, his conduct was such as to command their personal friendship; their respect for his professional opinion, and a thorough enjoyment of his companionship.

All that now remains of the life that so quickly passed away is the remembrance of what was accomplished in it. The grave hides the mortal part, but in the hearts of all that knew him there abides a loving memory which will long continue. Ours is the sad duty to deplore his loss, and to console those who mourn. We shall not meet nor greet him any more on earth, but the grave has not hidden nor can it hide his memory, and the love we had for him.

"Some find work where some find rest,

And so the weary world goes on;

We sometimes wonder which is best;

The answer comes when life is gone."

We beg his family will accept on the part of the physicians of Catskill Village their heart-felt tribute to his worth, and their expression of the sense of personal loss to each one.

J. A. DEANE,	GEORGE L. BRANCH,
CHARLES E. WILLARD,	L. P. HONEYFORD,
F. C. CLARK,	W. M. RAPP,
STANLEY VINCENT,	F. P. QUINLAN,
J. P. ROUSE,	ROBERT SELDEN.
F. W. GOODRICH,	

DEATHS.

FREDERICK E. BEAL, M.D., New York City, died August 8, 1912.

FREDERICK F. HOYER, M.D., Tonowanda, died August 16, 1912.

WILBUR FISK LAMONT, M.D., Catskill, died August 1, 1912.

DELOS B. MANCHESTER, M.D., Oneonta, died July 21, 1912.

ARTHUR H. PELLETTE, M.D., Whitney's Point, died July 6, 1912.

A. G. TRIPP, M.D., Cicero, died July 28, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

A Journal Devoted to the Interests of the Medical Society of the State of New York

ALGERNON THOMAS BRISTOW, M.D., Editor

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Vol. XII.

OCTOBER, 1912

No. 10

EDITORIAL DEPARTMENT

THE HOSPITAL YEAR.

THE Board of Regents of the State of New York has recommended the legislature to pass a law requiring candidates as a preliminary to the State Board Examination to show evidence that they have passed one year in a hospital, either in the capacity of internes or as clinical clerks. It will be of interest to examine this proposition from two standpoints, that of the candidates and that of the hospitals.

So far as the prospective physicians are concerned, it is quite obvious that it is of advantage to the public that they receive their licenses to practice medicine only after fullest proof of competency. It would be delightful if no one was allowed to practice medicine nor surgery nor any of the specialties except tried and proven experts. We should all of us like to be the peers of men like Osler, Janeway, Murphy or Keen. It is quite evident, however, as these men attained their eminence after years of actual practice that their successors will have to gain their knowledge and pre-eminence in the same way. The hospital year whether passed as interne or clinical clerk can be no more than a beginning. It

is also evident that if the recommendation of the Board of Regents becomes a law, of necessity many candidates for a license will prefer to present a year as clinical clerk, rather than a year as interne, since to present the year as interne would require the majority to submit to what would be in effect a year and a half of waiting and not a year. Hospitals do not make a clean deck the first of June and put in an entirely new force of internes. Moreover the term of service of hospitals varies greatly, from one year up to two years and even longer. Take those which, few in number, have a one year term. If the number of internes on the house staff numbered four which is rather a small average, it is evident that but one of the four could enter the hospital on the completion of his college course and so be eligible, one year later to the State Board examinations. Two men might enter together if the service was divided strictly into medicine and surgery, but this is not usual except in large hospitals which require a much larger staff than four men and also a longer term of service, nor would such a division be advantageous to the candidates, since their hospital education would be one sided. It is fair to suppose that a hospital

with a house staff of four men would take a new man every three months. Thus A alone entering in June on receiving his degree would have but a single year to wait before becoming eligible for his State examinations. B, entering the hospital in September, would be compelled to wait fifteen months after his four years course in medicine. C, entering in December, eighteen months and D, the man securing fourth place and entering in March would have to wait twenty-one months before eligibility.

The average time which would elapse before eligibility could be secured would be sixteen and one-half months, but as eligibility and an examination period would not necessarily coincide it is evident that the time at which a candidate would secure his license might extend under this minimum hospital system to almost two years. The hospital year therefore does not mean the extension of the medical course to five years, but to almost six, unless the State Board is prepared to hold examinations every three months. Even then, it is evident that the average course will be almost five years and a half. But many hospitals will be unwilling to adopt a one year system. Experience has shown that there are most serious objections to so short a term. If the service is a mixed service and this will usually be the case in a hospital requiring no more than four internes, the successive positions will usually run somewhat as follows: junior physician, junior surgeon, house physician, house surgeon. The hospital therefore has the services of a house physician for but three months and that of the house surgeon for the same length of time. Whatever may be said of such a system as applied to medicine, it is distinctly bad for a surgical service. This hardly requires argument, it is so obviously true. We may therefore expect many hospitals to decline to impair their efficiency by changing from the longer term to which they have been accustomed, to the one year term.

The effect of this would be evidently to still further lengthen the medical course so that for the majority of men it would easily extend well into the seventh year on account of the necessity of waiting for vacancies. It is quite true that a considerable number of men possessed of sufficient capital to make the long

wait possible already take hospital positions which entail a long service, but it is one thing for a man to do voluntarily what his capital permits him to do and quite a different thing for the state to compel him to do something for which his means may be inadequate.

Already the age of earning capacity of the young physician in this country is much greater than it is in Europe. This is partly accounted for by the peculiarity of our educational system. Can we afford to still further lengthen the period of probation so that a man will reach the age of twenty-six or twenty-seven years before he can even think of earning a living? The proposed situation is one that at least admits of discussion. Its merits are by no means entirely obvious.

What is to be done with the man who earnestly tries to get a hospital position and fails to do so? Does the State intend to make it obligatory upon all hospitals, public or private to open their wards to men who may be distinctly objectionable as internes? What is to be done with the interne who is dropped from a hospital for some breach of discipline? Suppose Cupid plays a not unusual prank and the young interne goes out with a nurse and both are caught by the argus eyed supervisor or superintendent, "Off with their heads," says the book of rules. The nurse thereupon loses the few months which she has served in the hospital without compensation, but the interne loses the opportunity to take his state examinations in this state and must go elsewhere to practice medicine. Yet he has violated no law of the state nor has he necessarily committed any sin against the moral law. On the one hand the state says to the young man you must show evidence that you have passed a year in the hospital, on the other, the hospital superintendent says "you have violated rule X of the regulations and must go. We are not concerned with your state examination." It is all very well to say that candidates for examinations must obey the hospital regulations or take the consequences. To deprive a man of a few months of hospital experience is one thing. It is quite a different matter to deprive him of the power to earn his living, for a mere youthful indiscretion. Yet an obligatory hospital year might do exactly that very thing.

From the standpoint of the hospital, it is evident that to enable candidates to comply

with the new requirements its doors must be thrown open much wider than at present. What about competitive examinations? How can the state permit competitive examinations, which are destined to pick out exceptional men when it requires *all* students of medicine to take a hospital year? What equity would there be in permitting the large hospitals to continue to hold competitive examinations, in which to be successful most competitors enter special costly hospital quizzes yet compel smaller hospitals to accept all comers with a degree. If the hospital year is to be made obligatory it is incumbent on the state to provide hospitals for all candidates, but how can this be done until the hospital becomes a state institution under state control as in Germany and France?

What will the proposed system advantage the hospital? It seems reasonably certain that if this recommendation becomes a law the term of service in the hospitals will have to be uniform and all be reduced to one year. The disadvantages of such a system have already been pointed out. It is bad both for the individual and the institution.

There is one way in which the disadvantages of such a system might be obviated and that is by having a paid resident staff of indefinite tenure, under whose instructions the hospital work might be continued with the assistance of the medical student. This, of course, would add a considerable item to the hospital budget. Are hospital trustees fond of adding to the expense account? Yet all these things require consideration when we talk of an *obligatory* hospital year.

The proposition that the medical student shall become a clinical clerk and not an interne is interesting. With the exception of the histories, which are for the most part already sufficiently bad without being made worse, the clinical records of the hospital are made by the nurses, whose duty it is to make the vital records and observe and put in writing the changing symptoms of the patients under their care. Is this work to be taken from the nurses and transferred to the hands of the clinical clerks? What then is to become of this part of the education of the nurse? The medical school of the nurse is the hospital. She gets all her training within its walls. Under the new system is she to become a

maker of beds, a giver of baths and a subordinate to a lot of medical students? We wonder what the authorities of the State Nurses Association will say to that proposition, who already wish to make of the nurse a near-physician? From the hospital standpoint, the introduction of a lot of clinical clerks would result in a good deal of confusion and make the nursing problem, already not without difficulty, worse than at present. So far as history taking is concerned every hospital physician knows how bad is the present system. The junior on the staff is usually the historian. He is just out of medical school. Under the competitive system at present in vogue, he is a picked man and yet he does badly enough. Why should it be otherwise? It often takes some skill as a cross examiner to elicit a correct history. The only man really competent to get a correct and satisfactory history is the visiting physician. It would be possible and highly advantageous so far as the quality of the histories is concerned, if all histories were taken by the visiting physician and dictated to the clinical clerk. This again would add to the burden on the visiting staff, which in this country serves without compensation—whose members indeed are expected to support the hospital by the sums paid into the treasury by their private patients.

The hospital year is an admirable project theoretically, but there are evidently several view points from which it may be observed which throw some sharp shadows into the perspective.

Without doubt, however, all difficulties and objections will be readily solved by the enthusiastic theorists. The public will doubtless welcome our increased efficiency. Our incomes will grow *pari passu* with the increased cost of our investment. Law makers will continue to turn a deaf ear to our good friends, the quacks as they demand state recognition and joyfully enter into competition with us. Everything will be lovely for everybody but the doctor. Medicine is already the most difficult of all professions to enter, the most costly in the training and years of study required and offers the poorest financial return on the investment of any the learned professions. The profession wishes to increase its load. The State hastens to assist. "Issachar is an ass bending between two burdens."

Original Articles

SOME CASES ILLUSTRATING OCULAR
DISTURBANCES DUE TO DISEASE
OF THE NOSE AND ACCESSORY
SINUSES.*

By JOHN E. WEEKS, M.D.,

NEW YORK CITY.

IT is not proposed in this paper to discuss the more evident cases of ocular disturbance due to disease of the nose and the accessory sinuses, but to present a few more or less obscure cases—types of conditions that when observed by the oculist, if not easily recognized by him, should cause him to have a thorough examination of the nose and of the associated pneumatic cavities made by a competent rhinologist. Conditions depending on disease of the antra, frontal sinuses and the anterior ethmoid cells are not mentioned.

CASE I.—Dr. F. S., age 48. A furuncle developed on the inner aspect of the ala of the nostril, accompanied by intense neuralgic pain. At the beginning of the third day there was marked photophobia, swelling of the lids and conjunctiva, rather profuse lachrymation. The right pupil was slightly larger than the left and the power of accommodation of the right eye was less than that of the left, making it difficult to read without increasing the power of the right reading lens. There was a rise of temperature and the patient felt so ill that he remained in bed two days. At the end of a week, on subsidence of the furuncular inflammation, the ocular disturbance passed away.

CASE II.—Mr. E. J. C., age, 30. Came to my office November 28, 1911, having been referred to me by Dr. Kurth, of Schenectady, N. Y. Has been troubled with sticky eyes for about ten years. On waking in the morning the eyes would be painful and the patient would experience some difficulty in opening them. The discomfort would last until about two o'clock in the afternoon when it would pass and the patient would be free from annoyance until the next morning. The right eye was more troublesome than the left and the patient would resort to the wearing of a patch over that eye from time to time when that eye was painful or fatigued.

On examining the nose the right inferior turbinate body was found to be hypertrophied and there was a septal spur on that side. An error of refraction was corrected and the patient was referred to Dr. Coakley for treatment of the nasal defect. The patient writes under date of March 7, 1912: "You may be interested to know that the operation on my nose made my eye worse for a time. However, as soon as the nose

healed the eye began to improve, and its progress has been fairly steady."

In this case I do not think that the trouble with the conjunctiva and the eye pain were wholly due to the condition in the nose, but I have no doubt that the latter was contributory and the operation brought about a better state of affairs.

CASE III.—Mrs. J. E. O., age 32. Came to my office January 3, 1906. She began to have difficulty in the use of the eyes at the age of fifteen years, headaches, often prostrating, and inability to read or use the eyes for close work. She had never been able to wear "properly correcting lenses," as they gave her much more pain than she experienced when she wore a simple plus lens; had seen many oculists in various parts of the civilized world, always without relief. In 1902 a partial tenotomy of both externi was made by a Chicago ophthalmologist; now has diplopia most of the time; periods of intense headache; cannot read or do close work without much suffering.

Status præsens: No disease of the eyes. Refraction:

R. E. + 0.25 \ominus — 2.75 ax. 23°. V = 20/40
L. E. + 0.5 \ominus — 3. ax. 140°. V = 20/70.

Esophoria 7 to 10 degrees. Glasses were prescribed January 4th, and worn until January 19, 1906, when it was found that the axis of the astigmatism in the right eye had apparently changed. The esophoria was apparently a distressing symptom. Glasses as follows were now prescribed:

R. E. + 0.25 \ominus — 2.75 ax. 28° \ominus p. 1½ b. out.
L. E. — 0.5 \ominus — 3. ax. 140° \ominus p. 1½ b. out.

There were no symptoms at this time pointing to nasal or sinus trouble. However, I examined the nasal cavity, finding no secretion in the nose nor any evidence of serious involvement. The only peculiarity was a narrowing of the nasal cavities. The inferior and middle turbinate bodies were in quite close approximation to the septum. The patient was enabled to do some reading with the glasses-prescribed and returned to her home. However, she did not have complete relief and in May, 1906, she returned to New York and permitted me to do a partial tenotomy of the left internus which resulted in reducing the esophoria to 1 degree at 20 feet and produced orthophoria at 13 inches. Comparative comfort was obtained and enjoyed for about two and one-half years. In March, 1909, the eyes were again thoroughly examined, and, except for a very slight change in the axis of the astigmatism, found to be about as before. Glasses were prescribed to correspond with the change noted. The punctum proximum was well within nine inches. More or less severe headaches were experienced during the month following. In January, 1910, the patient was

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

under my observation for a period of about four weeks. During this time the refraction was determined repeatedly. The axis of least curvature varied in the right eye from 30° to 37° ; in the left eye from 142° to 152° . An axis corresponding to the mean testimony of the patient was given and a +I. D. was added for reading, as the p.p. was not quite up to nine inches. The vision of each eye had improved, being now 20/30 in the right; 20/50+ in the left eye. Esophoria 3 degrees at 20 feet; orthophoria at 13 inches. I examined the nose at this time, finding some hyperemia with very narrow passages. However, as the patient disclaimed any discomfort referable to the nose, I did not suggest anything further than the use of a cleansing spray, should there be any nasal discomfort. The patient's headache continued without relief and the headache appeared to be aggravated by use of the eyes. The patient consulted Dr. Black, of Milwaukee, who, after examining the eyes, referred her to Dr. Henry M. Fish, of Chicago. The nasal cavities were examined, and, although no actual disease was found, it was suggested that the narrow meatus on the right side might be causing pressure symptoms, and, on the consent of the patient, the middle turbinates on both sides were reduced in size. This occurred in the early spring of 1911. The headaches immediately disappeared, without changing the glasses that I had prescribed, and the patient has been entirely relieved of discomfort in the use of the eyes up to my last advice, which were some ten months later. The vision remained approximately unchanged.

In this case spasm of the ciliary muscle, pain referred to the eyes and orbits, and cephalalgia in the form of a pressure neurosis, was apparently caused by an anatomical defect in the nose with congestion of the vessels of the nasal mucous membrane, but without actual inflammation.

CASE IV.—The report of the following case is by Dr. C. G. Coakley, except where otherwise indicated.

Miss Laura G., age 45, teacher, was referred to me by Dr. Dunning on September 27, 1905. She complained of pain in the left supra orbital region, diplopia, nausea, neuralgia on the left side of face and temporal region; no anterior or posterior discharge; present attack had lasted about eight days. Patient had had similar attacks before, ever since childhood, lasting four or five days to two months. Attacks had been very frequent during the last few years. From 1890 to 1906 patient had considerable discharge from left nasal cavity; left antrum had been opened in 1895 and in 1898. Examination of the nose showed left inferior turbinate swollen; the anterior portion of the middle turbinate had been excised; no secretion visible in the nose. On trans-illumination the frontal sinuses were equal, although small, the left antrum very dark, no illumination of pupil, where as the right antrum

and pupil illuminated well. The old scar under the left cheek was congested and on pressing over the left antrum, a small amount of secretion came away. A small fustula was found and enlarged. This was followed by the escape of one-half ounce of thin, foul-smelling pus. The patient was referred to Dr. H. Knapp for an examination of the eye. On September 28th, he reported as follows: "In Miss G.—'s eyes I find no organic change, the vision and fields are normal. She has diplopia which is not due to paresis, but to mechanical hindrances. The double images are distressing, but their disappearances will depend on the removal of the bony obstacles." We continued the packing of the antrum without much improvement, and on October 11th the patient was sent to Dr. John E. Weeks for another examination of the eye. Dr. Weeks reported: "Diplopia in all parts of the field of fixation, most marked when looking down and to the left. Exophoria 4 degrees; right hyperphoria 13 degrees; vision, with correction of the ametropia, normal in each eye. No change in the fundi oculorum. Tropometer:

R. E. In 44, out 41, down 52, up 30,

L. E. In 47, out 40, down 27, up 40.

There was evidently some interference with the action of the inferior rectus muscle of the left eye."

On October 20th, under chloroform anesthesia, the antrum was widely opened through the canine fossa, and the thickened polypoid mucous membrane removed from the entire antrum. No communication whatever could be found between the antrum and the nose. I have never seen such a condition before. When the operation was about completed, I found a small bleeding spot under the orbit, which, when followed up, proved to be an extension from ethmoid cells or from the antrum, forming a second cavity over the top of the antrum between that and the floor of the orbit proper. This cavity was opened up so as to be made a part of the antrum. Patient made an uneventful recovery from the operation.

The following notes on this case are supplied by Dr. Weeks:

"November 24, 1905 (six weeks after operation by Dr. Coakley), Exophoria 2 degrees; no vertical error. The tropometer showed a return almost to the normal. The patient was well until February 8, 1906, when she experienced pain in the left orbit. Began to see double at noon February 10, 1906. Double vision passed during the afternoon of February 11th. Fields of vision normal in extent. Fundi oculorum normal. Power of extra ocular muscles not diminished. February 16th: Upper lid left eye swollen. February 23d: Upper lid still slightly swollen. On examining the power of the recti muscles with the tropometer, there was found to be a slight uniform diminution in the strength of all. The patient was suffering from a 'cold in the head.'

On September 10, 1906, the eyelids began to swell, severe orbital pain was experienced, lateral movement of the eye gave pain. September 17th: Lids of left eye slightly swollen, lateral movement caused pain in the left orbit. The patient was suffering from an exacerbation of nasal catarrh. Asperin gr. vii every three hours. September 20th: Patient experienced great pain in the left eye and head during the night. Vision normal, no change in the interior of the eyes. February 15, 1908: No attack since September, 1906. Never went more than three months without an attack before. This attack began in the right eye, followed by involvement of the left eye to some degree.

"Status præsens: Some swelling of the eyelids and slight congestion of the conjunctiva, both eyes. With head in primary position, esophoria $\frac{1}{2}$ degree. No vertical deviation of visual planes.

Tropometer: R. E. In 33° to 35° ; out 30° ,
L. E. In 45° ; out 33° .

Vertical movements not impeded. Very slight hyperemia of the right optic disc. Vision normal in both eyes."

On February 15, 1908, patient returned with swelling of right upper lid; some pus was found in the right middle meatus. The right ethmoid was freely opened, since which time the patient has had no recurrence of diplopia or neuralgia.

CASE V.—Mrs. S. M. B., age 30, came to my office October 24, 1910. History of disturbance of vision of left eye beginning eight months ago. Had a severe cold at the time. No black spots, no floating opacities, no flashes of light, no specific history.

Status præsens: Right eye, normal; left eye,

disc pale; V = 20/100; relative central scotoma for all colors; fields of vision normal in extent. Patient anemic. Prescribed sajodin gr. viii t. i. d. and iron. Referred patient to Dr. Coakley for an examination and treatment of the nasal cavity and sinuses. His report follows:

"Mrs. S. M. B.—, age 30 years, was referred to me on October 24, 1910, by Dr. John E. Weeks. The nasal mucous membrane was considerably congested on both sides; left middle turbinal cystic. Probe passed into left sphenoid sinus showed mucous membrane thickened. Advised amputation of the left middle turbinal, and opening of sphenoid and posterior ethmoid. This was done on October 26th. The mucous membrane lining the sphenoid and posterior ethmoid were hyperemic and considerably edematous. There was a slight amount of mucoid secretion in the sinuses. Patient made an uneventful recovery and was discharged cured on December 2, 1910. Patient has been seen frequently since that time and has had several attacks of acute rhinitis without any special involvement of the sinuses."

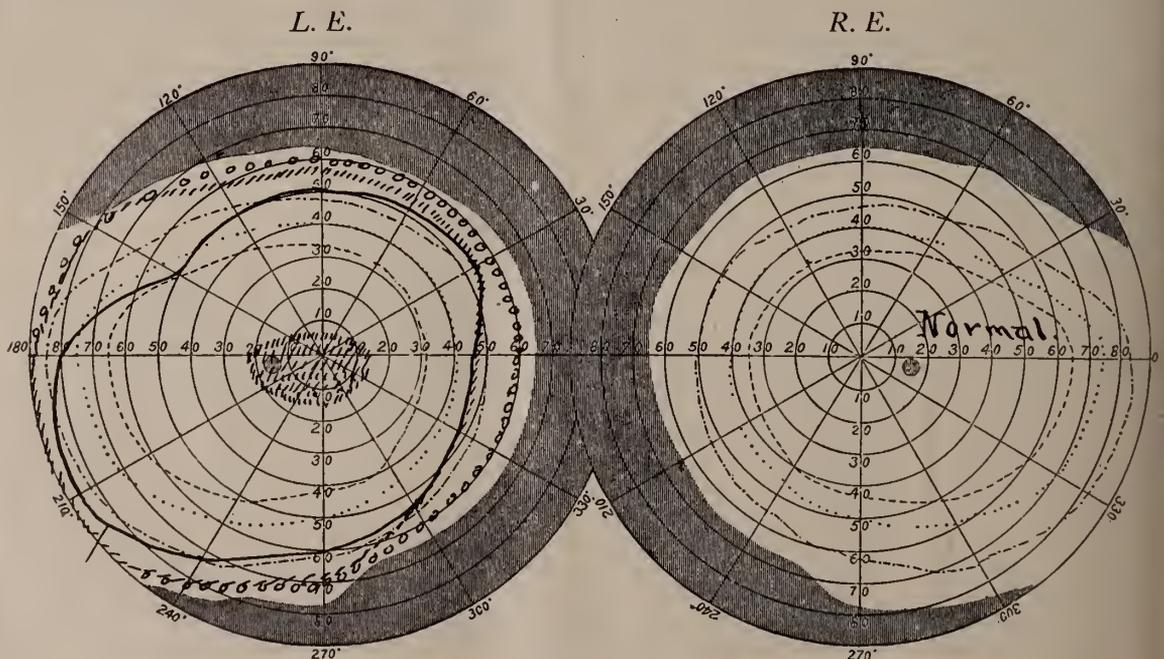
November 3d: Had some coryza, discontinued sajodin.

November 28th: Vision, R. E. = 20/20; L. E. 20/70+.

February 1, 1912: Left disc still a little pale; V., R. E. = 20/20; L. E. = 20/20.

The above is a case of retro bulbar neuritis, affecting the left optic nerve, due to an affection of the posterior ethmoid cells and the sphenoid sinus on the left side.

CASE VI.—Mrs. F. P. H.—, age 33 years, came to my office April 23, 1907. Three days before she noticed a film on the left eye, which has gradually increased. Since the age of four-



teen years, patient has suffered from severe neuralgia of the fifth nerve from time to time, lasting one to seven days. Attacks precipitated by excitement. Of late they were apt to occur at menstrual periods.

Status præsens: Left optic disc pale. Arteries smaller than normal. V. = 20/200. No evidence of inflammatory disturbance in the eyes. Right eye V. = 20/20. Visual field of left eye contracted concentrically both for form and color (see Fig 1). Antra and frontal sinuses apparently normal. No evidence of syphilis. April 24th: Vision of left = 6/200. Prescribed KI. Hg. and Fe. in moderate doses. Referred the patient to Dr Coakley, whose report follows:

"Mrs. F. P. H—, age 33 years, was referred to me by Dr. John E Weeks on April 23, 1907. Examination of the nose showed left middle turbinal cystic. A probe passed into the left sphenoid detected a thickened membrane and small amount of secretion in the cavity. Patient was advised to have her left middle turbinal amputated; sphenoid and posterior ethmoid cells widely opened. This was done on the same day under cocain anesthesia. After removing the cystic left middle turbinal, the mucous membrane lining the sphenoid and posterior ethmoid was considerably thickened and polypoid in character. On July 1, 1907, the wound was completely healed. The mucous membrane of the sphenoid and posterior ethmoid was normal. Patient returned to the office December 23, 1907, complaining of a cold in the head. There was no involvement of any of the accessory sinuses. On December 28, 1908, patient had a slight acute rhinitis. There was considerable dry mucus in the left nasal cavity. The nose was irrigated with normal saline solution and bicarbonate of soda on two successive days. Patient was last seen on April 27, 1911, at which time the sinuses were still normal."

April 27, 1907: Vision L. E. = fingers at 18 inches.

May 8, 1907: Vision L. E. = 6/200. Visual field enlarged. Now show a relative central scotoma. Medication continued.

May 23, 1907: Vision L. E. = 20/40.

July 1, 1907: Vision L. E. = 20/20. Internal medication continued.

October 14, 1907: Vision L. E. = 20/20. Visual fields normal in extent. No central scotoma.

March 8, 1911: Left optic nerve is still a very little pale. Vision and visual fields normal. No neuralgia.

The above is a case of optic neuritis occurring well back near the chiasm, caused by disease of the sphenoid sinuses on that side, which cleared up as a result of an operation on the nose and accessory sinuses, apparently aided by internal medication.

CASE VII.—Mr. H. P. W— came to my office September 26, 1911, referred to me by Dr.

Frank Daniels. The vision of the right eye had been failing during the last two weeks, shortly after having acquired a "cold in the head." Had had a dry catarrh for many years.

Status præsens: V. R. E. with +1.5 D. = 2/100; L. E. with +1.5 D. = 20/20. Exudative neuro-retinitis right eye. Elevation of the disc. Veins considerably enlarged and tortuous. Arteries smaller than normal. Exudation into the retina above, below and to the temporal side of the disc. Left eye normal. Measurement of the visual field of the right eye showed a defect in the outer lower third (see Fig. 2).

The patient was referred to Dr. Coakley, who reported as follows:

"Mr. H. P. W— was referred to me on September 29, 1911, by Dr. John E. Weeks. Examination of the nose showed a septum deflected to the left, large cystic right middle turbinal in contact with the septum and outer wall. Probe passed into the right sphenoid would feel slightly thickened mucous membrane, but there was no secretion in the cavity. Patient was sent to Dr. Caldwell for an X-ray plate. X-ray plate showed very large frontal sinuses, large sphenoid; shallow but otherwise normal pituitary fossa. Patient was advised to have cystic middle turbinal excised and sphenoid and posterior ethmoid cells widely opened. On September 30, 1911, the right middle turbinal was amputated and right posterior ethmoid and sphenoid cavities opened widely. The mucous membrane lining these cavities was thickened and edematous. No secretion was found in either of these cavities. On October 21, 1911, sphenoid and posterior ethmoid region was completely healed. On November 8th, patient developed acute rhinitis with involvement of the right frontal, anterior group of ethmoid cells, and the antra. There was little or no involvement of the posterior ethmoid and sphenoid. The acute suppuration of the right frontal, ethmoid and antrum lasted an unusually long time, and did not clear up until the latter part of December, 1911. Patient was last seen on January 17th, at which time there was no evidence of any disease in any of the accessory sinuses. It is rather remarkable that this patient should have had an infection of the frontal, anterior ethmoid and sphenoid without any involvement of the posterior ethmoid and sphenoid following so soon after the operation on these last two cavities."

October 11, 1911: Optic neuro-retinitis, subsiding. V. = 20/30—.

November 7, 1911: Elevation of right optic disc $\frac{1}{4}$ mm. Retinal exudation gone, with the exception of a few minute points in the deeper layers of the retina at the macula. V. = 20/20—.

April 3, 1912: Right disc pale, not elevated. No exudation. Retinal vessels in the upper nasal quadrant of the retina small, walls thickened. V., R. E. = 20/20. The field of vision for form is indicated in Fig 2.

The above is a clear case of monocular neuro-retinitis induced by the disease of the posterior ethmoid and the sphenoid cells, on the right side, presenting some difficulties in diagnosis because of the subacute nature and remote site of the nasal inflammation.

Coakley for examination of nose and accessory sinuses. As there was a history of rheumatism, I prescribed the salicylate of soda and bicarbonate of soda, moderate dose. The following is Dr. Coakley's report:

"Mr. A. G—, age 48 years, was referred to me by Dr. John E. Weeks, on November 22, 1911, with the request to know whether the sinuses were diseased. The patient complained of a slight post nasal discharge, but was not aware of any nasal obstruction. The patient had become addicted to the use of codeine, so much so that at the time of his first visit he was taking ten grains of codeine daily. Inspection of the anterior nares showed very little secretion, septum moderately thickened and multiple polypi in both nasal cavities, almost completely blocking up the nares. Post nasal examination showed polypi projecting from each choana posteriorly into the naso-pharyngeal space. There was very little room for air to pass through the nose. On trans-illumination both frontal sinuses illuminated equally, and through an area about one-eighth of an inch above the eyebrow. Both antra were dark, neither pupil illuminated. The patient was referred to Dr. Caldwell for a skiagraph which was received on November 23d. It showed two symmetrical frontal sinuses, $\frac{3}{4}$ " high and $\frac{5}{8}$ " broad. Both ethmoid regions were very cloudy, the left more so than the right. Both antra were cloudy, the right somewhat more than the left. The transverse plate showed very deep frontal sinuses with a markedly cloudy area; ethmoid region very cloudy; sphenoid sinuses medium in size and very cloudy, sella turcica slightly above normal in size, but not large enough to indicate a tumor of the hypophysis, and the region of the antra very cloudy. As a result of the combined nasal and skiagraphic examination a diagnosis of pan-sinusitis was made. On November 25th, under cocaine anesthesia, I removed about twelve small polypi from the left middle meatus, amputated the whole of the left middle turbinal, removed portions of the posterior ethmoid cells, and slightly enlarged the sphenoidal opening. Owing to considerable bleeding and some pain at the time of the operation, I was unable to proceed further. On November 27th the patient stated that he had had no pain in the left eye during the last two days. Had not been without pain in the left eye for two successive days for two years. On November 20th I removed several polypi from the right nasal cavity. On December 2d several polypi were removed from the middle ethmoid region in the left nasal cavity. Each antrum was washed out through the middle meatus and considerable thick, gelatinous secretion came away with the irrigation fluid. On December 20th, under cocaine anesthesia, I removed more polypi from the posterior portion of the left middle meatus, opened a large cell, presumably a posterior ethmoid or sphenoid. On December 28th, under

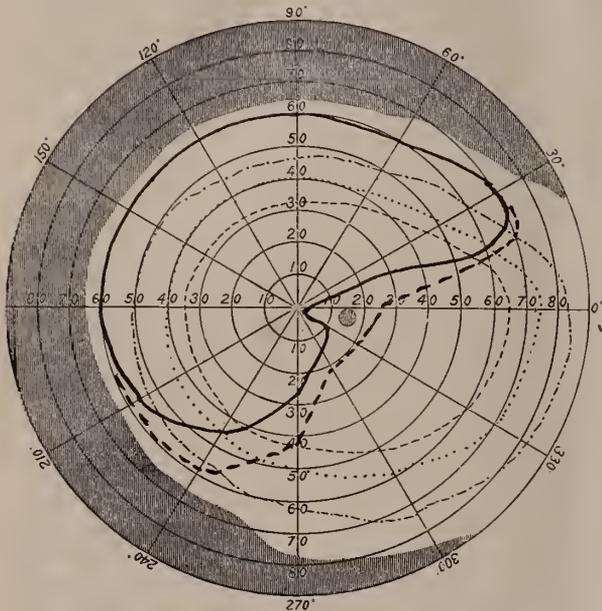


FIG. 2.

CASE VIII.—Mr. A. G—, age 48, came to my office November 15, 1911, referred by Dr. J. Rudisch. Seven years ago had first attack of iritis. Since that time has had a number of attacks, the left eye being the more affected. In the fall of 1909 vision was much diminished, but soon returned to some extent. During the last six months has had much pain in the eyes with redness of the ocular and palpebral conjunctiva and some iritis. History of gleet of long standing when a boy. Has had the complement fixation test made twice. Negative both times. Has had glycosuria, varying from a trace to 4 per cent., some acetone and indican, albumin a trace. Has been under treatment for his eyes for the last two years. Has taken much mercury and potassium. No examination or treatment of nasal cavities. History of rheumatism.

Status præsens: Diffuse episcleral congestion both eyes. Pupils moderately dilated from use of atropine. Multiple filliform posterior synechiae right eye. Vitreous body hazy, particularly in the left eye. Papillitis in both eyes; elevation $\frac{1}{3}$ mm. right eye, $\frac{3}{4}$ to 1 mm. left eye. V., R. E. = 20/70; L. E. = 20/200. Concentric contraction of the field of vision left eye of about ten degrees. R. E. Tn. +; L. E. Tn. The patient was referred to Dr. Sondern. Examination of urine showed albumin, sugar, etc., as mentioned above. Blood pressure 135 mg. of Hg. Wassermann negative.

November 21, 1911: Patient referred to Dr.

cocaine anesthesia, I amputated the right middle turbinal and removed several small polypi from the middle of posterior ethmoid region. On January 11, 1912, under chloroform anesthesia, the right inferior turbinate was amputated. On account of the interference with vision, the sphenoid and posterior ethmoid cells were widely opened, and the polypoid mucous membrane removed as far as possible. Since this operation the patient has had but two or three attacks of pain in either eye, and those for only a few hours at a time. There is still considerable secretion coming from both antra and a slight amount of mucoid secretion from each frontal. Inspection of the nasal cavity by means of a pharyngoscope shows no polypi in the right side, and only during an acute attack of rhinitis is there any edematous swelling of the mucous membrane on the left side."

On receiving the report from Dr. Coakley I considered the condition of the eyes to be due to the condition of the ethmoid and sphenoid cells, and awaited the results of Dr. Coakley's treatment. The pain and episcleral redness disappeared as by magic when the pressure from polypoid masses was relieved and recurred whenever after operative work, or as a result of taking cold, the pressure in the sinuses recurred. At the present time the eyes are improved in condition. V., R. E. = 20/50+; L. E. = 20/100-. The papillitis is subsiding and the diffuse haziness of the vitreous body disappearing.

CASE IX.—Mr. J. J. H.—, age 38 years, referred to me by Dr. Albert E. Munson, came to my office October 8, 1907. Right eye became more prominent than the left five years ago. The bulging was accompanied by dull pain in the eye and forehead which was worse in the morning and after using the eyes. The bulging gradually increased for a year, then decreased. During the last six months the prominence of the right eye has markedly increased. No history of syphilis. No history of Graves' disease.

Satus præsens: Right eye bulging, the apex of the cornea being 8 mm. in advance of that of the left eye. Rotation approximately normal. V. = 20/30+. Iris reacts normally. Field of vision normal. Slight œdema of optic disc at nasal margin. Diplopia not present. Tension of both eyes slightly plus. Veins of right eye slightly overfull. Graefe symptom not present. The patient was referred to Dr. Coakley for an examination of the nose and accessory sinuses. Dr. Coakley's report follows:

"Mr. J. J. H.—, age 38 years, lawyer, was referred to me by Dr. John E. Weeks, October 9, 1907. He has had a foul smelling discharge from both nasal cavities for five years, and has been treated for this by various physicians. On examination of the nose there was pus in both middle meati; a small, vascular easily bleeding polyp in the right middle meatus; a small, vascu-

lar but bleeding polyp in the left middle meatus. Left frontal sinus illuminated through a small area, and the right frontal sinus through a slightly larger area. Neither antrum illuminated, neither pupil illuminated. On post nasal examination pus could be seen issuing from both choanæ. Patient was referred to Dr. Caldwell for an X-ray plate. X-ray plate showed left frontal sinus much larger than right; both frontals ethmoid and antra diseased. Patient refused external operation and elected intranasal treatment. Both antra were opened widely through the inferior meatus, ethmoids removed with Hartmann punch forceps and large opening made in each sphenoid. These operations occurred at various times, beginning October 26, 1907, and lasting until March 27, 1908. Early in December, 1907, it was noticed that in pressing the globe of the right eye backwards into the orbit, thin, greenish, foul-smelling pus containing streptococci would enter the nasal cavity in the region of the posterior ethmoid cells. It was impossible to pass a probe into any sinus from which this pus came. On March 27, 1908, patient was operated on by the usual Killian method. Frontal sinuses were found to be extensively diseased; remaining ethmoids were removed and sphenoid more widely opened. Patient made an uneventful recovery following this operation, but the exophthalmos remained and there was still the same purulent discharge from the posterior portion of the nasal cavity, when pressure was made on the globe of the eye. Patient continued under treatment until May 11, 1908, when he disappeared from treatment until October 24, 1908. There was still the same purulent discharge in the posterior wall of the nasal cavity, when the globe of the right eye was pressed upon. On November 7, 1908, patient took a severe cold, and there was considerable redness and edema of the right upper and lower lids, and marked increase in the exophthalmos. By the afternoon of this date patient's condition became so markedly worse that he decided upon an immediate operation. Five-thirty P. M. I made an incision through the upper lid parallel with the orbital arch. On attempting to lift up the periosteum from the under surface of the frontal bone, the elevator opened into a large cavity from which two teaspoonfuls of thin, greenish, very foul-smelling pus exuded. It was found that this cavity was at the apex of the orbit, and that a probe could be passed back to the optic foramen. The cavity was filled with a mass of freely bleeding granulation tissue. The wound was carefully packed with iodoform gauze and allowed to heal by granulation. The cavity was completely healed at the end of three months, since which time the patient has had no return of his trouble."

June 12, 1908: Right eyeball, 7 mm. in advance of the left. Condition otherwise, so far as the eye is concerned, as on October 8, 1907.

May 6, 1909: Right eyeball, 4mm. in advance of the left.

April 11, 1912: Right eyeball, 4 mm. in advance of the left, vision normal.

This is a case of exophthalmos due to the formation of an abscess above the floor of the right orbit, near the apex of the orbit, due to purulent inflammation apparently occurring in an "orbital" ethmoid cell.

REMARKS.

Of the cases presented, Case I represents a reflex neurosis, affecting the upper branch of the fifth nerve on the right side and the motor branches of the third supplied to the sphincter of the iris and the ciliary muscles of the right eye. The cause was evident.

The third case was a neurosis with ciliary spasm and at times intense cephalalgia induced by pressure of hypertrophied turbinates without any sign of inflammation at the site of the trouble. All that presented was occasional hyperemia.

The fourth case was a very peculiar one, presenting œdema of the tissue of the orbit and interference with the action of the various recti muscles as a result of a diseased condition of so-called orbital ethmoid cells on both sides. The ocular disturbance, diplopia, limitation of rotation, exophthalmos and hyperemia of right optic disc, being produced when there were exacerbations in the inflammatory condition of the nasal and accessory cavities.

The fifth and sixth cases are cases of monocular retro-bulbar neuritis, excited by disease of the posterior ethmoid and sphenoid sinuses, the left side being effected in both cases. Almost complete recovery occurred in both cases as a result of appropriate treatment of the sinuses.

The seventh case is one of marked exudative neuro-retinitis, affecting the right eye only, as the result of a non-suppurative inflammatory process affecting the posterior ethmoid and sphenoid cells on that side, associated with a deviated septum. The inflammatory process was apparently of a septic nature capable of inducing inflammation in adjacent tissues. The rapid improvement in the condition of the eye by subsidence of the neuro-retinitis, following appropriate treatment of the diseased cells, was extremely gratifying. However, the permanent defect in the visual field teaches that permanent injury to the optic nerve and retina may be done in a relatively short period of time in spite of the complete removal of the cause.

The eighth case is a remarkable one, showing as it does that the optic nerve, retina and the entire vascular coat of the eye may become inflamed as a result of disease of the ethmoid and sphenoid cells. It is lamentable because of its long duration without being recognized, on account of the more or less permanent injury that was done to the eyes, and the avoidable pain suf-

fered. The prospects now are that the vision will improve to some degree, but return to the normal can scarcely be expected.

The ninth case is very remarkable. Various diagnoses had been made. Orbital neoplasm was insisted upon as being present by a number of ophthalmologists. A remarkable feature was the obscurity of the origin of the pus, even when its presence was discovered, and the difficulties sometimes encountered in reaching and removing the focus of disease.

The wide range of ocular symptoms covered by these cases indicates the possible ocular disturbances that may be occasioned by abnormal conditions affecting the nasal cavities and the accessory sinuses and teach the desirability of co-operation with the rhinologist in obscure cases of neuroses and actual disease affecting the eye.

I thank Dr. Coakley most sincerely for his kindness in furnishing me with his notes on the cases reported, and permitting me to embody them in this article.

KERATITIS NEURO PARALYTICA AFTER REMOVAL OF THE GASSERIAN GANGLION.*

By WALTER BAER WEIDLER, M.D.,

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TRIFACIAL neuralgia is a painful affection of the fifth or trigeminal nerve, generally due to some form of toxemia or traumatism. The exact lesion is a neuritis or degeneration, usually ascending, affecting any part of the nerve or its nucleus. Bernhardt says that in 66 per cent. of the cases of trifacial neuralgia, it is the first trunk or the ophthalmic division that is involved, but in a small number of the cases the whole distribution of the trigeminus may be affected. Keratitis neuro-paralytica is a very serious condition affecting the cornea, often seen after gasserectomy. The operation of gasserectomy is performed for the relief of the condition spoken of as trifacial neuralgia or tic doloureux. Most serious complications involving the eyes often follow this operation and it is with these affections that my paper has to deal, but more especially the neuro-paralytic keratitis. Keratitis neuro-paralytica following this operation is far more frequent than we are lead to suppose from a study of the literature. A great number of these patients develop this affection months and even years after the gasserian ganglion has been removed. One of the cases reported in this paper is an example of the keratitis coming on a year after the operation. If it were possible for us to keep accurate records of these patients for five years after the ganglion has been removed, I am sure that there would be a much

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

greater number of such cases recorded, and that the percentage of serious eye complications after the removal of the ganglion would be much higher than our present statistics show. It is with this thought in mind that I raise the questions: Is not this loss of eyes unnecessary? Secondly, is it not possible to give the same relief to these patients without the great danger to life by some other form of treatment than the surgical?

The medical treatment of trifacial neuralgia has been and is still very unsatisfactory, unless the neuralgia is migrainous in origin. Dana has tried the injection of strychnine in 15 cases and concludes that in those cases of facial neuralgia, extending over a period of one or two years, the treatment will almost invariably arrest or control the disease. In cases that have lasted over six years, and in those cases with neuritis and sclerosis, the results are doubtful, and there may be failures and remissions. In those cases extending over 15 or 20 years, the treatment is of no avail. It is well to note that there was never a single eye affection in any of his series.

For the past ten years much attention has been paid to the value of the alcohol injection of the trigeminus nerve and its branches. From the various papers that have been written on this method of treatment, one is impressed with the safety and ease with which it can be done. The relief from terrible pain and agony that is afforded these unfortunate patients and the almost complete absence of the eye lesions makes it a duty for the ophthalmologist and surgeon to advise this form of treatment in trifacial neuralgia.

Patrick (*Jour. A. M. A.*, 1912) after the treatment of 150 cases by the alcohol injection method, says that it does not cure, but that there is nothing that does cure this condition but a perfectly executed gasserectomy, and unfortunately these are very rare. The alcohol injection is effective immediately and the relief may last from six months to four years and is effective in cases that have had the cutting operation previously. It is not a dangerous procedure, not a single fatality being recorded. He has only seen two eye complications follow this method of treatment, and these were paralysis of the sixth nerve, and a simple keratitis. Both conditions cleared up under treatment. It is especially valuable in the very old and feeble, who may have other grave diseases. The use of alcohol injections does not in any way make a gasserectomy any more serious or difficult.

Blair (a personal communication) states that he has treated 70 cases with the alcohol injections and answers the question in this manner: "As to the comparative value of the extirpation of the ganglion and the deep injection of the trunks, I am convinced that the decision is decidedly with the latter. The patient more willingly submits to the injections, and the resulting paraesthesias and anesthetics last as a rule less than six months and the patient is disabled but a few

days. With the exception of one case, there was no corneal disturbance and no eye protector was worn. In the majority of the cases relief from pain lasted from 18 months to two years. In some of the cases it has been shorter, while in many there has been no return of pain. In one of these latter, the injection was made five years ago, this case having been a sufferer for nine years previous. In every instance, so far as I know, relief has been again obtained by re-injection." His cases were carefully selected and there was no doubt as to the diagnosis. The patients were carefully examined by the oculist, rhinologist and neurologist and it was due to this great care in making the diagnosis that he ascribes his good results.

Campbell, in a personal communication, says that he regards deep injection of the first and second branches as detrimental to the eye. In one case that had received three deep injections of the second branch, the patient had a progressive deterioration of the eye and at present has very little vision. He does not state how many cases he has treated by this method.

Keller (*N. Y. Med. Jour.*, 1911) reports his findings in 48 cases of the alcohol injections after the method of Levy and Boudanin, extending over a period of three years. He concludes that successful injections or series of injections is followed by relief for about the same length of time as that following a first resection of a peripheral nerve. Re-injections give a longer period of relief than repeated resections. There was not a single case reported in this number where there was a serious eye complication. In case number XXXIII there was complaint that "eye troubled her very much," and in case XXXIX a purulent conjunctivitis developed a few days after the injection.

Bodine and Keller (*N. Y. Med. Jour.*, 1909) report 20 cases and state that after a study of our own cases, few in number though they are, together with the cases reported by Kiliani, Hecht and Patrick, we believe the accumulated experience justifies a favorable verdict, in behalf of the deep injection as a successful palliative treatment in tic douloureux; and we believe after careful study of the interesting figures by Scholser's, together with those submitted by Ostwalt, Levy and Boudanin, that we are entitled to agree with the summary of Hecht:

I.—With the pathology of trigeminal neuralgia still undetermined and the operation of gasserectomy expedient only in desperate cases and as a last resort, interest in the intra-neural injection of alcohol is justified.

II.—Alcohol in dilutions of 70, 80 and 90 per cent. appears in clinical trials to be the best remedy in all cases with painful paroxysms of tic douloureux.

III.—The prognosis for cure in a permanent sense from a single injection is not good. Prognosis in the sense of complete palliation after one or several injections is excellent. Recur-

rences, however, are to be expected anywhere from six months to a year.

Killiani (*N. Y. Med Jour.*, 1908), reported 55 cases treated by the Schlosser method of injection and states that it was successful in 52 cases, and further says that he considers it the most efficient form of treatment because it permits of repetition when recurrence appears. In the hands of experienced operators, alcohol injection is a comparatively simple operation and practically free from risk.

The surgical treatment of this condition is not to be regarded as a cure, because many of the cases where gasserectomy has been most successfully performed the pain has returned. What concerns us more is the danger to the eye; and in many cases where gasserectomy has been done, keratitis neuro-paralytica occurs with the subsequent loss of vision and the eye. This most unfortunate accident happens too frequently, therefore we should consider well before we advise this form of treatment for the relief of this most dreadful disease.

Cushing (*Jour. A. M. A.*, 1905), reports a series of cases and reviews very thoroughly the grave dangers to the eye after gasserectomy. Of importance, above all others, are the post-operative ocular complications which, since the first attempts to remove the ganglion, have been a great cause of concern to the surgeon. It has been shown, alas, too frequently, that from one cause or another an enucleation of the eye may eventually be necessary, and it is wise to have an understanding with the patient and friends that relief from pain may demand such a sacrifice. Twice in his series of 20 cases this was necessary, and there were a number of serious forms of keratitis and paralysis of different ocular muscles, external and internal. He claims that neuro-paralytic keratitis, as a result of the ganglion extirpation, need never occasion anxiety if proper precautions are taken to guard the eye, particularly for a few weeks following the operation. He believes with Hanan, who made a series of experiments in 1896, that all changes of the cornea after trigeminal paralysis are only consequences of external influences on the eye, unprotected through its loss of sensibility, and that this applies as much to the slight initial lesion, an especial consequence of dryness, as to the extreme degree of keratitis. In regards to the cessation of secretion of the lacrymal gland there is also an added danger, but Cushing thinks that the glandular activity returns after two or three weeks, and this may be explained by the gland being activated by fibers from the facial nerve through the great superficial petrosal. The contracted pupil after a few days does not dilate with cocain, evidencing, according to Schultz, that degeneration of the post-ganglionic fibers has reached the dilator muscle. With regeneration of these traumatized or divided sympathetic fibers, lacrymal secretion returns, the

pupil regains its normal size and the enophthalmos, if it is observed, disappears. The oculomotor palsies have occurred with great frequency when the ganglion is removed in toto but they generally clear up. The commonest sequel is, injury to the abducens, and this is explained by the anatomic proximity of this nerve to the upper edge of the ganglion. The pupillary miosis remains for an indefinite period. It reacts to light and accommodation, when eserine is dropped into the eye the pupil contracts, atropine will dilate it. Krause reports that there was no post-operative pupillary changes in any of his cases. Cushing concludes with the statement that, from his clinical experience, one very naturally inclines to the view that purely traumatic influences or the combination of corneal dryness with infrequent (xerotic theory), or incomplete closure of the lids, alone play a part in the causation of corneal inflammation, and that the pure trophic and tropho-traumatic and vaso-motor palsy theories are hardly tenable for the keratitis neuro-paralytica that results in many of these cases post-operative.

Frazier (personal communication) says that from his findings of his series of 50 cases, there were two cases that had serious keratitis follow the operation. One of these two cases is Mrs. M., case report No. 1, the other was a farmer, and I will add a third one, Mrs. Y., case No. 2. He thinks that keratitis develops more frequently in the removal of the ganglion than after section of the sensory root. He believes that there are trophic centers in the ganglion itself. A great deal depends upon the attention and care the patient receives after leaving the hospital. The slightest evidence of trophic disturbances long before there is anything like ulcer formation, should be treated by immediate closure of the lids, and in this precaution we find that Horseley and Keen are in accord. Cushing uses the Buller shield and claims that this is the better method of protection. Frazier believes that the tendency towards trophic disturbances is very much greater immediately after the operation than at any subsequent time, and if every precaution is taken and the case is kept under continued observation until the critical period is past, corneal disturbance will be a very rare occurrence.

Deaver (*Jour. A. M. A.*, 1909), in an article on the surgical treatment of tri-facial neuralgia by gasserectomy, says that a word must be spoken of the distressing complication which is apt to follow, even when the operation has been well performed and proper care has been exercised by the surgeon, namely panophthalmitis. He recommends the suturing of the lids or the use of Buller's shield as protective measures after all operation for the removal of the ganglion.

The cases of neuro-paralytica keratitis after gasserectomy are usually of the most severe form that come to our notice. There is often

a gray opacity seen in the center of the cornea, with later a slight depression. The epithelium over this area is exfoliated and we have a small ulcer formed. This loss of epithelium is usually central, but the loss may spread to the periphery of the cornea, leaving always a small portion remaining at the corneo-scleral margin. The stroma becomes clouded and opaque and later yellowish, and this is followed by the formation of a hypopyon. The cornea may in the graver case be invaded by the purulent process so that there may be a perforation and the iris prolapsed. In some cases general panophthalmitis is set up with a phthisis bulbi, completing the picture. In other cases the process is not so serious and a partially useful eye is retained. The prognosis, however, should be set down as very unfavorable.

The course of the diseases is rather slow and there is always slight conjunctivitis and ciliary injection. There is little or no pain in the early part of the keratitis, but later when the process extends into the anterior chamber, iris and ciliary body, the pain may become quite severe.

The cause of neuro-paralytica keratitis has been a subject that has engaged the attention of the ophthalmologist, neurologist and pathologist for years. It was Magendie who found, through his experiments with rabbits, that injury to the trigeminus nerve would produce a keratitis, and this is the condition which we now call neuro or tropho keratitis paralytica.

The *neuro-trophic theory* of Magendie is the result of his experiment, and he concluded that there were trophic fibers running for the gasserian ganglion to the corneal epithelium, through the fifth nerve and ending in filaments of the ciliary nerves. These experiments of Magendie were later confirmed by the work done by Bernard and Gaule. It was further shown that when the ganglion was cut or injured neuro-paralytica keratitis resulted, but if the fifth nerve alone was cut there was only corneal anesthesia produced. These experiments were supported by the clinical observations of von Graefe, who also attaches great importance to the absence of tears as one of the causes of the keratitis.

The *trophic and traumatic hypothesis* has been held to be the most satisfactory explanation by Parsons, Head, Sterren, Wilbrand and Sanger. They all admit that there are such things as trophic nerves in the corneal epithelium, and that these nerves play an important part in the protection and safety of the cornea from foreign bodies and accidents. They insist that there must be a central distribution of the nerve roots or ganglion cells to explain the keratitis.

The *vaso-motor theory* does not find many supporters. It is claimed by some that after removal of the ganglion there is seen a vaso-constriction of the eye, more marked in the pericorneal regions. (Spalitta.)

Seydel includes four phenomena in the pro-

duction of this form of keratitis, namely, vaso-motor changes, corneal anesthesia, a paralysis of the symphetic, and a trauma, all these being necessary for keratitis and ulceration.

Senfleben and Snellen believe that if the eye is properly protected the keratitis would not follow. This we know is not true, because we have seen keratitis follow when there was ptosis, and when the eye has been protected by artificial means.

The *dessication theory* is based upon the claims that the diminution of the secretion of the tears, coupled with the less frequent winking of the lids, the corneal epithelium becomes dry, and foreign bodies are no longer removed from the cornea, and, in consequence, necrosis of the corneal epithelium follows, with ulceration.

Davis and Hall have made a number of experiments with monkeys, observing the growth of bacteria after injury to the gasserian ganglion and the trigeminus. They found that they were able to demonstrate the presence of a certain bacillus which they have called X.

This bacillus is found in 30 per cent. of the normal eyes, but was found in all the patients who had neuro-paralytic keratitis, together with streptococci. In cases which did not develop keratitis after removal of the ganglion the bacillus was not found. They therefore conclude that they are justified in suspecting that the presence of the bacillus in the sac is necessary for the production of neuro-trophic keratitis.

It will be readily seen from our study of the various causes that have been advanced, that all of these different conditions do not exist in all of the cases of keratitis neuro-paralytica. Paralysis of the trigeminus or removal of the gasserian ganglion with trophic disturbances should be regarded as the cause, *i. e.*, absence of the lacrymal secretion; presence of a foreign body (dirt or dust); anesthesia of the cornea and the presence of some bacteria of suppuration should be considered as contributing causes or factors. It is not necessary for all of these to be present in order to have this form of keratitis develop, but one or more of these factors are usually present in neuro-paralytic keratitis.

The two cases that are reported in this paper have followed the removal of the gasserian ganglion.

CASE RECORD No 1.—Mrs. P. M., æt 48, history of trifacial neuralgia of the right side of the face for the past five years. Was treated for the "tic" by the injections of alcohol, and had relief from the pain for eight months. On May 12th she was operated on by Dr. Frazier, who removed the gasserian ganglion. Three days after the operation patient found that she was unable to open the right eye. The ptosis gradually improved, however, and I first saw her October 10, 1909, and the condition of the eye was as follows: partial ptosis, some injection of the bulbar and tarsal conjunctiva, cornea was anes-

thetic but clear and smooth. In about ten days the cornea showed the presence of a small central ulcer and this condition increases in spite of treatment. The eye felt dry and the patient said that when she cried she found that there were no tears from the right eye.

Treatment: Boric acid wash, atropine, hot compresses, compress bandage and arsenious acid, grs. 1/30th t. i. d. A very unusual complication was noted at this time. Patient had been out in the cold and on coming into the house sat close to the stove to warm herself, holding her head close to the stove to warm her face, which was more cold than the rest of her body. A few days later she noticed a sore spot over the forehead above the right eye. This became a most distressing neuro-trophic ulceration of the scalp. The ulcer was about the size of a silver dollar, extending to the periosteum, and only responded to the most persistent treatment. There was loss of sensation for touch and pain over most of the right side of face but the sensation for heat and cold was intact.

March 30, 1910: The lids are swollen and the ptosis is about the same as when first seen. Profuse muco-purulent discharge and marked injection of the conjunctiva, and the ulceration of the cornea involves one-half its diameter. It was deep, extending into the stroma, and a large hypopyon seen in the anterior chamber. Iritis and cyclitis, with the pupil undilated and partially filled with exudate. Vision was reduced to counting of fingers at one foot and tension was minus two.

October 6, 1910: Skin over the right side of the face is more sensitive to pain and touch. The acute inflammatory symptoms have all subsided but the ptosis remains and there is also a large leucomatous opacity involving one-third of center of cornea. The eye seems to be shrinking and the iris atrophic and the pupil shows remains of the exudate. Light perception and projection good. Wassermann was negative, as was the urine.

Dr. Frazier tells me that this was the first time that he has seen this complication after the removal of the gasserian ganglion. In his letter he describes the operation briefly as follows: "The injury to the nerves adjacent to the ganglion was the result of an accident which was quite unlooked for. Just as I was about to pick up the sensory root with a special hook which I use for this purpose, the patient's head moved and the hook became entangled in the nerves, which have since been affected. In eradicating the root I exercised the greatest care and thought I had been successful in avoiding any injury to the nerves. The ptosis and the ocular symptoms which developed shortly after the operation I had hoped would be of only a transitory nature."

The last time I saw this patient was on March 26, 1912, and at that time the ptosis was slightly

improved. Patient told me that she massaged that side of the face and eyelid every day and this may account somewhat for the improvement. The lid shows marked injection of the superficial vessels. There is still the complete absence of tears and the corneal epithelium is dry. The lower half of cornea is opaque from the infiltration and leucoma formation which is penetrated by several new blood vessels. There is always some slight injection of the conjunctival vessels above and below the corneal scleral margin. In the center of the pupil, which is small, there is a white opacity which appears to be an interior capsular cataract following the inflammation. Tension seems normal, iris reacts to light in the upper half, and the vision at the present time is fingers at four feet. Patient still complains most bitterly of the sensation of pain and heaviness over the upper part of face and temple. The eye is painful at times and there is frequent recurrences of inflammatory attacks, when the pain is quite severe. The pain over the lower half of the face has been almost entirely relieved by the gasserectomy, but the patient is most decided in her statement against the operation. She regrets extremely that she ever had the operation performed, and is very sorry that she was not advised to be satisfied with the relief that she could have had from the alcohol injections. The surgeon who had given her the three injections advised her to have the operation performed but refused to do it himself.

CASE RECORD No. 2.—Mrs. M. Y., æt 58, came to me on account of severe facial neuralgia, telling me that she had been treated for this condition for over a year without any improvement. I advised an operation and sent her to Dr. Frazier, who operated upon her March 4, 1909, removing the gasserian ganglion on the right side. The operation was quite successful, as the neuralgia was relieved. There were no changes seen in the eye but she was advised to wear a shield over the right eye, which she did for several weeks. She reported to my office for about two months, making weekly visits, and during that there was no irritation of the eye whatsoever. The eye remained quiet for over a year. She was wearing glasses for distance all this time.

August 24, 1910, she came to see me, complaining of some pain and distress in the right eye. This condition had existed for a week during which time she had no treatment. The lids were swollen, there was a rather free discharge and a marked injection of the bulbar and tarsal conjunctiva. There was a central ulceration of the cornea involving about two-thirds of the central portion. The stroma underneath was grayish and there was a small hypopyon forming in the anterior chamber. The iris was discolored and there was partial synechia, as the pupil dilated irregularly under atropine. Vision was reduced to fingers at three feet. Patient com-

plained of considerable pain in eye and right temple.

Treatment consisted in the use of boric acid, atropine, dionin and hot compresses. Tonics were given in large doses and later compress bandage. The progress of repair was very slow and the woman was compelled to work for her living, and rather than wait months for the cure, with the expectation of a useless eye, which would be the very most that we could hope for, she consented to have the eye enucleated after five months of treatment.

Macroscopic section of the eye shows very nicely the area of ulceration of the cornea. The ulcer is central and is about 8 mm. in diameter, and seems to have not only involved the corneal epithelium but Bowman's membrane and the substantia propria. Cornea is hazy throughout and the anterior chamber is of good depth. No deposits seen in chamber. Iris is grayish yellow in color, showing the present of the hypopyon and inflammation that had accompanied the keratitis. Lens is in position, showing senile changes. There is some absorption of the chorioidal pigment.

Microscopic examination. The corneal epithelial layer around the limbus and extending towards the center of the cornea is still present for about one-fourth of the corneal diameter. The rest of the corneal epithelium has been greatly changed by the ulceration, being absent entirely in the center together with Bowman's membrane. The stroma proper in the center is also destroyed and there is an attempt at repair. The outer layer consists of long, flat cells one or two thick, and directly underneath these cells is a homogenous layer, rather dense, staining deeply with eosin. Directly beneath this tissue are more cells that are round and polyhedral in shape. Bowman's membrane is absent over the center and there has not been any attempt to restore the loss. In the lamina propria near the cornea-scleral margin limited to the one side are seen several new blood vessels, besides the invasion of leucocytes. Descemet's and the endothelial layer is undisturbed. The sections that were cut first did not show any of the hypopyon. The iris tissue presents foci of round cell infiltration and also the loss of the pigment layer around the pupillary edge, due to the synechia. A section at a much lower level shows the angle well filled with leucocytes, pus cells and fibrino-plastic material. The cellular infiltration has extended to the ciliary body but no further in the eye.

This review of the work done by Patrick, Hecht, Killiani, Bodine and Keller, Blair, and Schlosser, with alcohol injections for the relief of trifacial neuralgia, with the great alleviation of the pain, and the almost uniform freedom from any serious eye complications, makes it appear to be the most satisfactory and safest method of treatment.

It should always be advised in all cases of tic douloureux, not only as the first form of treatment, but in nearly all of the cases the only treatment. It should be persisted in even if it does become necessary to give repeated injections, because of the great ease of performing the injections and the comparative freedom from any dangerous complications following and its absence of any mortality in its performance.

The consensus of opinion of the following eminent surgeons—Cushing, Deaver, Horseley, Keen and Frazier—is, that the removal of the gasserian ganglion is an extremely dangerous and difficult surgical procedure, requiring extraordinary technique. The mortality rate is from 5 per cent. to 50 per cent., depending on the individual surgeon's training and skill in the performance of brain surgery. Destructive neuro-paralytic keratitis follows many of these operations with the ultimate loss of the eye. It is quite true that many of these patients who are in the throes of trifacial neuralgia are willing to sacrifice an eye with the hope of relief from pain, but it may be possible that with further perfection of the technique and the additional knowledge that will come from our study of the "alcohol injection method," that we may see the time when the operation for the removal of the gasserian ganglion will no longer be necessary.

Thus a comparative study of the value and merits of the "alcohol injection" and gasserectomy has shown that the patient is assured of relief from pain for a varying period of time lasting for six months and in many cases for years. Furthermore, there has been over 300 cases of "alcohol injection" reported in this paper and in only one case was there a serious form of keratitis that followed, whereas in the 70 cases in which gasserectomy had been performed, neuro-paralytic keratitis followed in a considerable number of the cases, and in 4 cases enucleation was done as a final resort for the relief of distressing symptoms which were directly caused by the operation.

SOME COMMON RESULTS OF EYE-STRAIN.*

By WILLIAM R. BROUGHTON, M.D.,

NEW YORK CITY, N. Y.

THE uncommon is always of more interest than the common, and yet at least nine-tenths of our daily work is with the "common" things of life and so I venture to bring to your attention today some of the "Common Results of Eye-Strain."

By eye-strain I mean any error of refraction or any maladjustment of the ocular muscles, sufficient to cause suffering to the patient either in the eye itself or in remote organs.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

When I first began my eye work in 1887, the medical journals were full of articles *pro* and *con*, upon the influence of eye-defects on reflex nervous diseases. Dr. George T. Stevens had but recently written his prize essay on the cure of nervous diseases by tenotomy of the eye muscles. Among the neurologists, Dr. Ambrose L. Ranney was the first to accept the views of Dr. Stevens and no one of the older men present will forget the bitter controversy that ensued. Up to that time very little attention had been paid to the careful correction of refraction, cycloplegics were seldom used; and the correction of muscle defects was confined to the crudest operations for strabismus or at most to operations for high degrees of exophoria in accommodation.

Since that time writers have filled the journals with articles on eye-strain and whole volumes have been written on refraction alone and on the ocular muscles. Ophthalmologists from all sections have reported innumerable cases of headache, nervous prostration, digestive troubles, chorea, epilepsy and even insanity cured by the correction of eye-strain. Some have claimed that a man's whole physical, mental and moral nature is moulded in accordance with the curvature of his cornea and could have been entirely changed by a pair of spectacles properly fitted.

Even the magazines and daily papers have exploited the subject until the public has awakened to the importance of having the eyes examined, even if they do not know better than to go to some optician or doctor of optometry. The general practitioners are also becoming alive to the importance of eye-strain and frequently one of my hardest tasks is to make some doctor believe that a patient's headache is *not* due to ocular defect.

My excuse for bringing this subject to your attention is the fact that those who should be the first to recognize the importance of eye-strain are the last to give it the prominence it deserves. I mean the ophthalmologists, and, worse still, the neurologists. The majority of ophthalmologists have had but little experience with nervous diseases. Unless a patient shows cataract, glaucoma or other eye disease or some eye lesion indicating organic disease of the nervous system, he is too often passed quickly through the office as a routine refractive case and the time is not taken for the careful correction of refraction and muscles.

The neurologist is so engrossed with the intricate diagnostic points of organic diseases of the nervous system and believes so little in the influence of eye-strain, that the most exaggerated cases of reflex nervous diseases are not even advised to have the eyes examined, although I believe that eye-strain is more often than any other cause the underlying factor in reflex nervous diseases.

One of the commonest results of eye-strain and admitted to be so by all is headache due to

refractive error, and yet it is surprising how many such cases slip through the oculist's office, without relief, on account of a careless examination or a failure on the part of the doctor to impress upon the patient the necessity of wearing his correction constantly in properly fitted frames. The following case will illustrate the point:

CASE No. I. Mr. G. C. Age 31. Cartoonist.

History. Headaches for past three years, beginning in eyes and running through to the occipital region; very frequent and very severe so that he has had to stop work. Is very nervous at times. Has been examined by two well-known ophthalmologists.

Eye-Defects. Vision under homatropine

O. D. 20/15w +1.00s and +0.25c ax 90

O. S. 20/15w -0.25s and +1.75c ax 90

exophoria 3, abduction 8, adduction 18. Was wearing for reading occasionally O. D. +1.25s; O. S. +2.00c axis 90.

Treatment and Results. Glasses were ordered for constant wear to correct the refraction fully. One month later patient reported absolutely no headache and much less nervousness in spite of doing a full amount of work. He was told to return for treatment of the exophoria in case he had any return of headache.

Surely no case could be more simple and yet this man had been examined by two of our best-known ophthalmologists in New York, who gave him a partial correction for reading, but told him that his headache was probably not due to his eyes. When no other cause could be found, he was sent by his doctor for one more test of his eyes, much against his will, as he naturally considered that question settled.

In the multitude of routine cases and the pressure of "the next patient," how many such cases slip through our offices and go on through life suffering from pain that might have been cured?

Every chronic case should have the benefit of a very careful examination under a cycloplegic. A full correction of the astigmatism and as much of the hypermetropia as the eye will tolerate should at first be ordered in glasses for constant wear and the glass increased to a full correction as rapidly as possible.

But all eye headaches are not caused by errors of refraction, and when no relief is obtained by a careful and full refractive correction, it is the duty of every oculist to investigate very thoroughly the condition of the ocular muscles. Esophoria, hyperphoria, exophoria, cyclophoria, anaphoria and kataphoria are all frequent causes of headache in about the order named.

The following case of headache was due to one of the more uncommon defects in my experience.

CASE No. II. Mr. H. B. S. Age 38. Manufacturer. Referred to me May 1, 1903.

History. Headache for many years beginning

in the eyes and extending to occiput. It usually occurs two or three times a week and he rarely goes a week without pain. Has always had a tendency to look down and dislikes to look above the horizontal meridian or even to look straight ahead for any length of time when walking, or when talking to any one. Has had chronic indigestion, for which all kinds of treatment and diet had been prescribed without benefit.

Eye-Defects. Refraction under homatropine

O. D. V. 20/15w +2.00s and +0.25c ax 60

O. S. V. 20/15w +2.00s and +0.50c ax 75

No hyperphoria, esophoria or exophoria. No declination. Tropometer rotations: Up 23, down 52, in 48, out 43, in both eyes.

Treatment and Results. This patient had been wearing practically a full correction for his refractive error for many years with little relief. As the kataphoria was the only remaining defect in evidence I combined a 3 degree prism base up over each eye. He wore this glass nineteen days and reported that he was still having two severe headaches a week. Six degrees of prism base up over each eye was then given.

Five months later he reported that his headache stopped immediately after putting on the prism and he was free from pain for two months; but for the past three months he had had headache every week or ten days.

The rotations and balances were exactly as given before. As he had been so much relieved by the prism, he insisted that I operate, and rather against my will (as I dislike operating on inferior recti unless absolutely imperative), I performed a free graduated tenotomy on both inferior recti at one sitting. Twelve days later his upward rotation was 30 and the downward 50 in each eye. One month later he reported no headache since operation. Four months later he reported no headache except under excessive eye-strain and only three of those. He had no stomach trouble, ate everything he pleased and was in excellent health.

Five years later he came in for a slight change in his refraction. He was still free from headaches and his rotations remained 29 up and 50 down. For the past three years I have not seen him, but an occasional patient sent to me testifies to his continued good health.

Such a case gave the symptoms of typical eye headache and yet I venture to say that he would have been passed by most oculists, and I am confident such cases must have slipped through my own office without relief many times.

The influence of eye-strain in causing general physical and mental fatigue without definite nervous symptoms is more frequently overlooked, but is one of the very common results of eye-strain and is illustrated by the next case.

CASE No. III. Mr. H. E. F. Clergyman. Age 29. Referred to me February 24, 1908.

History. This patient was an exceptionally strong man physically and of great mental

power. He was fond of outdoor sports, took plenty of exercise and apparently led an ideal life for a professional man. He had no asthenopic symptoms nor headaches of any account. And yet several years ago he broke down with nervous exhaustion and for the past few years he has been obliged to give up work for a few weeks during each winter and always had a feeling of excessive mental and physical fatigue. His physician sent him to me to determine whether eye-strain might not be the underlying factor in his case.

Eye-Defects. Vision under homatropine, both eyes 20/15w +0.50c axis 90. No hyperphoria, esophoria 2-4, adduction 25, abduction 4.

Rotations:

Right eye, up 30, down 50, in 48, out 40,

Left eye, up 30, down 50, in 50, out 38.

Homonymous diplopia on looking to the extreme right or left. After wearing a 2 degree prism base out over each eye for a few days he showed: Esophoria 8, abduction 2.

Treatment and Results. Tenotomy of the internal recti was advised; but as is frequently the case, his family demanded another opinion and I sent him to one of our leading ophthalmologists, who wrote me a letter advising a change of his glasses to R. +0.37c axis 93, L. +0.50c axis 90, and to postpone operation until after his vacation. Then if he was not relieved to operate on the left internus to produce an effect of not more than two degrees. I replied that I proposed to let out the left internus at least six degrees and expected to have to let out the right an equal amount before obtaining a balance, as undoubtedly there was more esophoria latent. He went on his vacation, lived out of doors, did not use his eyes and returned free from all symptoms and in splendid physical condition. Two weeks later he telephoned me: "I have been home two weeks and am all in. When will you operate?"

I at once performed a free tenotomy on the left internus, obtaining an immediate result of six degrees. He kept right on with his work and felt so well that he would not have anything more done for five months, when a return of some of his symptoms brought him to me again and I divided the right internus as freely as I had the left. One month after the last operation he showed: Esophoria ½, adduction 30, abduction 7.

Three years have elapsed since then and he continues in perfect health in spite of an enormous amount of work.

This case is quoted in full to show how important it is to determine the "latent" muscular error and how little this is appreciated by some of our best ophthalmologists.

Another common effect of eye-strain is dizziness or vertigo, and here I expect to find hyperphoria. In patients past middle life this is usually ascribed to arterio-sclerosis and the patient is greatly surprised and correspondingly pleased

when this disagreeable symptom disappears on the addition to his glass of a prism base up or down or after graduated tenotomy of a superior rectus.

CASE No. IV. Mr. J. H. H. Age 71. First examination September 5, 1905.

History. For many years has had great difficulty in using his eyes, as any reading, theater, card playing or even golf playing, caused pain in the eyes and dizziness, which frequently amounted to severe vertigo. He had consulted several specialists and was supposed to have arterio-sclerosis.

Eye-Defects. When first seen he had 20/20 vision with his correction, which was

O. D. +1.00s w +0.75c axis 180 w 3½ prism base up and 2 prism base in.

O. S. +1.00s w +0.75c axis 180 w 3½ prism base down and 2 prism base in.

His muscle tests were: Right hyperphoria 7 degrees, exophoria 7 degrees, adduction 24, abduction 9, sursumduction, right 16 degrees, left 1 degree.

The above tests were taken with his glasses on and allowance made for the prisms in them, and I believe that all muscle tests should be made in this way in order to ascertain as much of the "latent" error as possible. The oculist who gave the glasses had advised against any operation on the muscles.

Treatment and Results. During the next three months three graduated tenotomies were performed on the right superior and one on the left inferior rectus. Three weeks after the last operation he showed: Right hyperphoria 1½, exophoria 2, adduction 35, abduction 6, sursumduction R. 11, L. 4.

He then went to Florida and a month later reported a marked improvement in his dizziness and in the use of his eyes. Four months later a 1 degree prism was added to his glasses for right hyperphoria. Six months after he reported no dizziness and ability to use his eyes two hours. One year later another degree of prism was added, and June 6, 1911, he was given O. D. +1.50s w +1.25c ax 180 with 2 degree prism base down; O. S. +1.50s w +0.75 c ax 180 w 1 degree prism base up. He showed: R. hyperphoria 3, exophoria 2, sursumduction, R. 6, L. 0. With the glasses he showed 20/15 vision, no hyperphoria, and the difference in the sursumduction was twice the amount of prism worn, as it should be to justify the hyperphoria. He reported that he has been free from vertigo for years and was using his eyes in comfort.

CASE No. V. Mr. G. W. P. Age 70. Referred to me February 13, 1912, for headache and vertigo.

Eye-Defects. Vision was 20/20 with his glasses, +0.25s and +0.50c in both eyes. Muscle tests were: Left hyperphoria 2, esophoria ½,

sursumduction, R. 2, L. 4. A 2 degree prism base up over the right eye was added to his glasses and all dizziness promptly disappeared and has not returned.

Another most common result of eye-strain, which is not even recognized by some of our eminent specialists, is the choreic twitching of the face, neck, shoulders and limbs of children of school age, and yet I rarely see a case of this sort that does not yield rapidly to eye treatment. These cases are frequently cured by the simple correction of refractive errors, but the following case shows one cured by the correction of hyperphoria alone.

CASE No. VI. C. S. Male. Age 12. Referred to me October 1, 1906.

History. For some months this boy had been suffering from severe choreic twitching and jerking of the head and limbs and was under the care of a well-known specialist on digestive troubles, who was treating him for rheumatism.

Eye-Defects. Vision under homatropine was 20/15 in both eyes, with +0.50s and +0.25c axis 90. Muscle tests: Left hyperphoria 3, exophoria 2, adduction 25, abduction 4, sursumduction, R. 2, L. 11; vertical diplopia with the red glass. After several examinations and the correction of the manifest hyperphoria with prisms, he disclosed about 15 degrees of left hyperphoria.

Treatment and Results. When I told the boy's father that his chorea was due to eye-strain, he was rather at sea, as the other consultant had told him it was due to rheumatism. I volunteered to talk the case over with the other doctor and tell him what a marked defect existed. To my surprise the doctor said, "But you know it is an acknowledged fact that all such cases are due to rheumatism," and he seemed to have no conception that eye-strain ever caused such conditions, although they are among the common experiences in my office.

Prisms for the hyperphoria at once relieved the symptoms and convinced the father that my diagnosis was correct. One month later two tenotomies were performed on the left superior rectus, and one month later still, the right inferior was divided. Two years later he showed no hyperphoria, esophoria ½, sursumduction, R. 4, L. 4. His chorea absolutely disappeared after the operation and only last week his father told me there had been no return. His son was doing well in his studies and was one of the best athletes in the university.

CASE No. VII. W. T. C., Male. Age 8½. Referred to me March 1, 1912.

History. Was a very delicate baby. Soon after beginning school he had severe nightmare, accompanied by spasm and rigidity of muscles. Last summer he began to roll his eyes, twitch his mouth, face and shoulders incessantly and had a dry, nervous cough. He was put under

one of the prominent New York neurologists, who ordered general treatment with some benefit, but did not suggest eye-strain as a possible cause. He also consulted a leading specialist in children's diseases, who prescribed diet, but no eye-test.

Eye-Defects. Under homatropine vision 20/20 in each eye with +1.75. L. hyperphoria 12, exophoria 12. Very marked left hyperexophoria jump on exclusion, but no duction tests possible. Glasses +1.50 with 5 degree left hyperphoria prisms were ordered for constant use. One month later the balance tests were the same and I obtained abduction 7, sursumduction, R 2, L. 7, no declination. Rotations: R. up 30, down 60, in 50, out 40; L. up 35, down 48, in 48, out 45.

A very free tenotomy was done on the left superior rectus and he now shows left hyperphoria 4 degrees. The change in his condition is already very marked and the casual observer would notice no twitching. It will require a year or two, with several tenotomies, to straighten such a case, and it is quoted now to show how marked a change can sometimes be obtained in a short time by a partial relief from eye-strain.

These two cases also illustrate how absolutely eye-strain is ignored by prominent specialists, who are supposed to be familiar with the causes of disease.

The time allotted for this paper will not allow of my mentioning chronic digestive disturbances, constipation, insomnia, nervous prostration, and numerous other reflex diseases that are commonly due to eye-strain.

I cannot close this paper, however, without reference to one class of cases which is commonly due to eye-strain and in regard to which the utmost incredulity still remains among oculists and neurologists in spite of the numerous cases that have been reported by many writers. I refer to the epileptics. Unless you take the ground that epilepsy is an incurable organic disease, and that any case of supposed epilepsy cured by any means was not genuine epilepsy, than I contend that epilepsy has been and can be cured by the correction of eye-strain.

I have seen many cases that have had every symptom of typical grand-mal and some cases of petit-mal that have had no attacks for many years following the correction of errors of refraction and of the eye muscles, sometimes of one, but usually of both forms of eye-strain.

It is not an easy task to cure one of these cases and any one who attempts to do so by one or two examinations, the hasty correction of refraction or the establishing of an approximate balance of the ocular muscles will usually fail. My experience has been that it takes from one to three or more years to treat these cases and that good results are not obtained until the

"latent" as well as the "manifest" errors have been corrected.

I shall give the next case in some detail, as it illustrates how much patience and faith are required by both doctor and patient if good results are to be obtained.

CASE No. VIII. Miss A. L. Age 23, referred to me December 3, 1890.

History.—Ever since she can remember she has had headaches, which became almost constant and often very severe. Has always had dyspepsia and been very nervous. When sixteen years of age she had her first so-called "fainting attack"; these attacks became very frequent and she was put on bromides, which have been kept up in large doses ever since. In spite of this she now has attacks about three times a year, constant headache and a great deal of dyspepsia.

Later I had a chance to see several of these "fainting turns" and found them typical grand-mal with cry, general convulsion, complete unconsciousness, biting of tongue, heavy sleep for one or more hours, etc.

Family History.—Mother has always had headache. Little is known of her father or her relatives. Two sisters are very nervous.

Eye-Defects.—Vision under atropine: O. D. 20/40 w + 1.25s and +0.25c axis 75 O. S. 20/20 w. +1.25s and +0.25c axis 135. On the first examination she showed L. hyperphoria $\frac{1}{2}$, esophoria 7. A few days later she showed esophoria 30 and with a red glass over one eye had homonymous diplopia of from 50 to 70 degrees. During the next two years the right internus was divided twice and the left internus four times almost completely, and the right inferior once. An apparent balance for a time would again be followed by marked esophoria. She continued to have numerous attacks. In 1892 the left externus was advanced and for two years she showed from two to four degrees of exophoria and had attacks almost every month; and was practically given up as a hopeless case.

In 1895 she returned again with marked esophoria and I advanced the right externus with an immediate overcorrection of 10 degrees and this overcorrection remained for a year; but in view of recurring esophoria, I did not venture to correct it. During these years she had tried treatment of all kinds by various specialists. Her nose was operated upon, she was given hypnotic treatment by a neurologist, and everything that could be thought of tried with no benefit. Her attacks were as frequent as ever.

In October, 1896, as the tests still showed exophoria 10 degrees, abduction 16, I divided cautiously the right externus. She returned two and a half years later and reported that she had two or three attacks soon after the opera-

tion, but had been absolutely free of attacks for two years. In 1902 she reported no attacks for five years, but had had three attacks recently. Her astigmatism had increased to $+1.25c$ and her glasses were changed.

In December, 1911, she reported no attacks for past eight years and she had only taken an occasional dose of bromide when she felt nervous. The vision was O. D. 20/30, O. S. 20/20 with her correction. She showed perfect muscle balance.

This case is one of the most remarkable in my records, as there was no improvement whatever in the attacks during years of treatment and yet as soon as a balance was obtained, the attacks positively stopped at once and have never returned except when she needed a marked change in her glasses.

I had expected to report other cases of epilepsy, but time will not permit and this case illustrates the necessity of a full correction of the eye-defects before results can be obtained.

In closing I wish to emphasize the following conclusions:

First.—Any reflex nervous disease *may* be due to eye-strain and a careful examination of the eyes should be demanded.

Second.—All errors of refraction should be estimated under a cycloplegic (in patients under 45).

Third.—A full correction of all refractive errors should be given as soon as the patient will tolerate it.

Fourth.—The frames must be accurately adjusted and the glasses worn constantly, and this must be impressed upon the patient.

Fifth.—All imbalance of the ocular muscles that remains, after the full correction of refractive errors has been worn for some weeks, should be corrected by operation or by prisms combined with the glasses.

Sixth.—Except in low grades of hyperphoria, but little permanent relief is obtained from prisms.

Seventh.—The correction of "latent" as well as "manifest" muscle errors is necessary to obtain results in severe nervous diseases due to eye-strain.

Discussion.

DR. A. EDWARD DAVIS: I had thought before listening to the reading of this paper that the exaggerated importance given to muscle balance of the extrinsic ocular muscles and graduated tenotomies had all but been abandoned. I still believe such to be the case, excepting by a very few ophthalmologists. The folly and futility of expecting to find perfectly balanced ocular muscles, even in the healthy and robust individual with normal eyes and perfect vision, has been shown repeatedly. A number of years ago, by

Bannister of the Army, who took for his test one hundred soldiers, and recently Major (Dr.) P. C. Field of the Army, has taken a like number of healthy men with vision of 20/20 or better, and found eleven (11) only with "absolute muscle balance," and pertinently remarks: "That only eleven out of one hundred normal individuals with normal eyes had perfectly balanced extrinsic ocular muscles is strong evidence that it is not usual or necessary for normal eyes to have absolute normal muscle balance."

Yet in the face of all this we have our muscle friends trying to arrive at an exact balance of the extrinsic ocular muscles by giving muscle gymnastics, by prescribing prisms and graduated tenotomies. Mr. Chairman and Gentlemen, such efforts and practice is folly of the worst sort. The extrinsic ocular muscles do not remain of the exact strength or balance any two days consecutively. As well might you expect a man to grip with a gripping machine the same number of pounds each day. It can't be done, and physiology as applied to one part of the body should hold for another part of the body; muscles vary in their power and action daily, yea, hourly.

Major Field's conclusions from his tests are so pertinent to the question under discussion that I venture to append them here.

(1) "That $\frac{1}{2}$ degree to 1 degree of hyperphoria and $\frac{1}{2}$ degree of esophoria and exophoria are unimportant, probably due to spasm, too often changing to opposite reading at repeated examination with the photometer, and hence not indicative of a true heterophoria.

(2) That too large a proportion of small latent deviations, both lateral and vertical, disappeared during a strict course of training with greatly improved physical conditions, to ignore the claim that improved physique, or the opposite, does affect the tone and balance of the extrinsic ocular muscles.

(3) That only 11 out of 100 normal individuals with normal eyes had perfectly balanced extrinsic ocular muscles is strong evidence that it is not usual or necessary for normal eyes to have absolute muscle balance.

(4) That the ordinary prism test for the individual muscles, considered with fixed ratios, when not checked by other tests, does not necessarily show 'latent disturbances of equilibrium' of 1 degree to 2 degrees, and, further, is more accurate in showing a real insufficiency than the photometer test.

(5) That the power or tendency to fuse is weakest and slowest in those who have no latent deviation to constantly overcome by increased innervation. Hence the prism test for individual muscles, if hastily made, may give a false idea of strength and balance.

(6) That the prism test and the Maddox rod

test proved more accurate in showing real deviations."

Dr. Broughton claims to measure the extrinsic ocular muscles as to balance to within a fraction of a degree in their active state. Yet he insists that the ciliary muscle should be paralyzed with a cycloplegic before the refraction can be tested properly. That is, it is assumed that the extrinsic ocular muscles are constant and uniform in action, but that the ciliary muscle is not; although all of these muscles are supplied by the same nerve, the third. So much for inconsistency.

As to the use of prisms, I may say I take off a great many, but prescribe exceedingly few, and only for vertical deviations. This indiscriminate prescribing of prisms ranging from $\frac{1}{8}$ of a degree to 10 degrees for apparent imbalance of the ocular muscles, I object to most emphatically. If the refraction of these patients is properly corrected and the general condition of the patient looked after (a point often neglected by the oculist, by the way), the proper diet, rest and general exercise insisted upon, together with general tonics, a great majority get relief; and of those who are not benefited in this way it has been my experience that they are not relieved by any other treatment whatsoever. There are some affections of the nervous system not to be relieved by eye treatment of any and all kinds, especially when the general condition of the patient is left out of consideration; and the sooner the narrow specialist recognizes this fact, the better for the patient.

As to the curing of epilepsy by means of prisms and cutting the eye muscles, I have no faith at all. It is true that occasionally an epileptic is benefited after such treatment is given, but it is equally true that epilepsy has occasionally been cured by placing a seton in the neck, by operating on almost any part of the body, etc. That any great proportion of epileptics, even of the function variety, can be cured by the use of prism, or by graduated tenotomies, has been disproven conclusively some years ago, when a commission was appointed and selected for the originator of this treatment (Dr. G. T. Stevens) to try his hand on. He failed utterly in these cases, Again, Dr. Gould tried his hand on patients at the Craig epileptic colony by giving them the proper refraction correction, and with little or no benefit to the patients, as reported by the superintendent of that colony. The proper care and general hygienic surroundings of these patients accomplishes more in the way of relief than everything else tried, it is also stated by the superintendent of this colony; and the extravagant claims made by those advocating glasses, prisms and graduated tenotomies must be ignored. Most of these cases of epilepsy are doomed to recurrent attacks, while occasionally only a case may be relieved by one treatment or another.

ON OCCUPATIONAL DISEASES OF THE EYE.*

By WARD A. HOLDEN, M.D.,
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THE book from whose publication modern sanitary science may be said to date—Ramazzini's *De Morbis Artificum*, or, as it appeared in English translation in 1707, *The Diseases of Tradesmen*—has little about the eyes of persons following the trades of that day. But in its famous chapter on the diseases of learned men, after describing the digestive disturbances and the melancholy spirits of learned men who use their brains too much and lead sedentary lives, the author adds the statement that scholars complain much of their eyes. Today the correction of refractive errors with glasses and improved artificial lighting have bettered the scholar's condition. But when we consider how frequently both external eye diseases and progressive near-sightedness are caused by over-use of the eyes in study, we must still regard the occupation of the scholar, from the kindergarten grade up, as one of the occupations most harmful to the eyes.

An excellent description of "Eye Diseases and Eye Accidents in Relation to Industrial Occupations," by Mr. Simeon Snell, makes up one chapter of Dr. Thomas Oliver's book on "Dangerous Trades." Mr. Snell, at the Sheffield Royal Infirmary, had exceptional opportunities for studying this subject, since in that manufacturing city, 30 per cent. of the male eye patients passing through his wards were admitted for accidents to the eye. Mr. Snell's classification comprises four categories of workmen. In the first category are those in whom a disturbing oscillation of the eyes—nystagmus—develops, because their occupation compels them to look constantly upward, thus straining the muscles that elevate the eyes. This occupational nystagmus is observed here and there among those engaged in various trades, but is most common in miners. Indeed, a large percentage of the men who work with picks in the low galleries of coal mines are incapacitated by this "miners' nystagmus." Change of occupation is the only remedy.

In the second category are persons whose trades require the use of substances that are poisonous when gaining entrance into the body. These toxic substances cause inflammation or degeneration of the optic nerve and retina, leading to impairment of vision. A few of the commoner poisons may be mentioned here. In the preparation of mining explosives di-nitro benzene is much used. In grinding and mixing this substance dust is given off which, when inhaled, poisons the worker. Ventilation and the use of closed mixing vessels will prevent its ill effects. Di-nitro benzene is used also in making aniline dyes. Hence, the handling of aniline dyes or the

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use of aniline hair dyes may cause disturbances of vision. In the vulcanizing of rubber, bisulphide of carbon is employed and its inhaled vapor frequently affects the sight. Less frequent are the visual disturbances from poisoning with other chemicals used in trades, although a score or so are known which are sometimes toxic.

In the New York City clinics lead and wood alcohol head the list of accidental eye poisons. There are 150 trades in which lead is used sufficiently to be dangerous. The diagnosis of lead affections of the optic nerve and retina is not always easy, but it is rendered more certain if there is an accompanying sclerosis of the retinal vessels, for arterial sclerosis is the cardinal symptom of lead poisoning. In some cases lead causes increased intracranial pressure with all the general symptoms of brain tumor, including an œdema of the optic nerve heads that cannot be distinguished from that due to tumor, so that with our present knowledge a differential diagnosis may not be possible. Decompressive operations have been done in a few of these cases, but the new von Braman operation of tapping the third ventricle by puncturing the corpus callosum would seem to be the operation indicated.

Lead poisoning has been greatly lessened abroad by laws which force employers to provide proper ventilation and the like. State Departments of Labor in this country are now gathering statistics of lead poisoning, and for the benefit of employers the National Bureau of Labor published last July a volume of 350 pages on industrial lead poisoning in Europe and America.

Wood alcohol is still used by some brewers in the varnish used in their vats and if forced ventilation is not employed the workman long in the vat may be poisoned by the inhaled fumes. Ten cases of death or blindness among beer vat varnishers have occurred in this state in the past two years—a matter which is receiving the attention of the State Department of Labor. Blindness occurs frequently among the ignorant city population from the drinking of wood alcohol knowingly, or unwittingly in cheap adulterated alcoholic drinks.

Wood alcohol in its first state has so vile a taste and odor that it cannot be used in compounds intended for internal consumption. In England the law prohibits its further distillation or rectification and there blindness from drinking wood alcohol is unknown. In this country wood alcohol is rectified and thus made less unpalatable. It is then possible to make use of it in adulterating whiskies, tinctures, essences, bay rum and the like. Our tax-free denatured grain alcohol for use in the arts, as made up in the bonded warehouses under government supervision, consists of 100 parts of high proof grain alcohol, 10 parts of rectified wood alcohol, and one-half of one part of benzine. Denatured alcohol, therefore, does not contain enough wood alcohol to be distinctly poisonous.

In the month of December last there were 70 sudden deaths among persons frequenting the Berlin municipal lodging house, due to wood alcohol taken in cheap spirits obtained in the saloons of the neighborhood. Within the following month the Austrian Board of Health issued an ordinance restricting the sale and the use of wood alcohol in manufactures, and prohibiting its use in any articles intended for internal consumption; and the New York City Board of Health added a section to the sanitary code prohibiting the use of wood alcohol in any food or drink or in any preparation for external or internal use by man. Such measures as these may be of benefit, but as the offence is a misdemeanor only, the penalties are hardly deterrent. The last saloon keeper in New York City to be convicted of poisoning customers with wood alcohol was fined \$50. A liquor dealer in Hungary in 1909 caused the death of 59 persons by wood alcohol poisoning, for which he was fined \$750. He appealed, but recently the appellate court re-affirmed the fine and added a three months' prison sentence. The trial of the Berlin offenders is now in progress.

Since poisoning by wood alcohol is chiefly due to ignorance, Dr. Charles H. May has proposed that the liquor dealers from the wholesalers down be instructed as to its very poisonous nature, and this we shall try to do in New York City. Most of the wood alcohol used by dealers in adulterating liquors and most of that used in mixtures made at home is doubtless bought under a trade name. Wood alcohol and denatured alcohol sold as such must be marked poison, but under a trade name wood alcohol may be bought from druggists without the poison mark and without even being labelled "for external use," as these two bottles purchased on 23rd Street last week show. On the labels of both appear the words, "Guaranteed under the Food and Drugs act, June 30, 1906," an actual encouragement to use the spirits internally. When druggists are compelled to label wood alcohol "poison," under whatever trade name they sell it, we shall have much less poisoning from its use, but so long as the rectification of wood alcohol is permitted in this country, certainly occasional cases of poisoning will be seen.

In the third category of tradesmen are those whose eyes are exposed to excessive light or heat and those who are required to look intently at bright near objects. The burnishers of silver, for example, suffer much from eye fatigue. Workers with molten metals, such as steel makers and those engaged in the electrical welding of steel, may suffer from serious injury to the retina if protecting goggles are not worn. And glass blowers have long been known to be particularly subject to cataract. In these trades goggles are worn of various hues and degrees of opaqueness, according to the nature of the injurious light and heat.

Strong electric light shining into the eyes in-

stead of being concentrated on the work in hand, is, as everyone knows, a frequent source of eye fatigue, headache and diminished efficiency. Electrical flashes due to the short circuiting of high voltage currents cause much eye injury because they occur unexpectedly and hence are not always guarded against. The skin of the lids may be burned, the lens or the retina may be permanently injured, and the shock experienced may give rise to hysterical blindness that often lasts for months.

In the fourth category of tradesmen are those whose work subjects them to the danger of injury from foreign bodies striking the eyes. Grinders, stone cutters and iron and steel workers are the greatest sufferers from such accidents. It would seem to be a simple matter to prevent injury to the eyes of grinders, for example, by having them wear goggles, but in practice the workmen complain that glass goggles cannot be kept clean, that mica goggles flake and that gauze mesh goggles become clogged; vision is interfered with in each case and the work is made difficult. So while workers exposed to light and heat will wear protective goggles, workers exposed to flying particles mostly refuse to wear them, preferring to risk an occasional injury. Efforts are now being made to find a material for goggles that will not have the disadvantages of glass or mica. If, however, the grinder or lathe worker will not guard his eyes with goggles, the employer may guard the machine with safety devices. Metal hoods over the grinding wheels and glass screens before his eyes will protect the operative and large screens of burlap will protect passers-by and workers at nearby machines.

Among the most serious of industrial eye injuries are those in which particles of metal penetrate the eye-ball. Eyes so injured, notwithstanding brilliant magnet extractions of iron foreign bodies, usually are of little value and they are, besides, a constant menace to the uninjured eye. Workmen who chip the irregularities from rough castings are particularly liable to such injuries, but chipping accidents may be greatly lessened in number by the use of pneumatic chipping machines. Cheap cast-iron tools which readily splinter also are frequent causes of blindness.

Besides the special dangers of particular trades, any occupation that requires constant close use of the eyes may lead to progressive near-sightedness in persons who are by heredity disposed to near-sightedness. Thus typesetters, proofreaders, watchmakers and men of like trades very frequently become progressively near-sighted, and are thereby rendered liable to dangerous deep-seated diseases of the eye.

The greatest harm is done before the twentieth year, hence the school naturally is responsible for much progressive near-sightedness. Children whose near-sightedness is increasing rapidly should not study much, and children whose sight

is defective from other causes cannot. These children usually are backward in school. The blind do perfectly well in the schools for the sighted after learning to read raised letters, as has been amply demonstrated in the public schools of New York City, but what to do with the undersighted has been a problem. A London oculist, Mr. Bishop Harman, recently established a myope school, and following this example, the supervisor of blind schools in the New York City public schools is about to form an experimental class of undersighted children, who will be taught without unnecessary use of the eyes. This, it is needless to say, is a very promising experiment.

Much of what I have said is a very old story indeed, but quite a new story is that of the organized efforts now being made in this country to conserve human life by preventing unnecessary occupational injury and disease. Conservation is a new word in the lexicon of America, and in the conservation of life we are in some ways a generation behind Europe. But the conservation idea is being grasped so enthusiastically that we must soon take our proper place among the advanced nations.

Last year public-spirited citizens here caused to be incorporated an American Museum of Safety, begun three years before—an educational institution for teaching safety, encouraging safety, and annually rewarding individuals and corporations that have fostered safety; thus following in the footsteps of eleven European countries. Last year, also, six of our states, again following the European lead, enacted laws requiring physicians to report to the State Departments of Labor cases of several common occupational diseases and poisonings, just as factory owners are required to report to the Departments of Labor accidents to their workmen. These reports will furnish statistics upon which will be based the necessary remedial legislation—necessary since employers have ever been slow to prevent occupational disease until forced to it by the law.

Federal and state workmen's compensation laws, which automatically assess damages for injury, must soon here, as already in most European countries, entirely take the place of our antiquated employer's liability laws which necessitate wasteful suits in court to obtain damages. With these new laws in force, all employees will be insured by one system or another. The insurance companies are already urging industrial corporations to install safety devices and thus reduce accidents to workmen. Manufacturing corporations and railroads, to gain the good will of workmen, and also to lessen damages paid for injuries, are, one after another, appointing committees of safety. In the American Museum of Safety may be seen sets of photographs from a score of large corporations showing protective devices introduced recently which have decreased accidents materially. I wish to present here photographs of appliances by which the U. S. Steel

Corporation has reduced its eye accidents 50 per cent., and also some of the pamphlets on prevention distributed by the museum.

The work in this direction of the many sections and committees of medical societies, and of boards of health, is known to you. The Committee on Prevention of Blindness of the New York Association for the Blind, of which I have the honor to be a member, is engaged in ascertaining the direct causes of preventable eye troubles and in taking measures, in co-operation with many different bodies, to eliminate such causes. Its annual reports, with which many of you are familiar, show, I think, that much is being accomplished along many different lines. And other state and national societies are similarly interested in conserving vision.

Perhaps the chief thing that this general movement for conservation means for each of us as practitioners is that when a distressing case of preventable blindness comes to our notice, our attitude need no longer be one of helpless indignation. If the matter is brought to the attention of certain of these bodies, we have the assurance that proper measures will be taken to provide for the correction, so far as may be possible, of the conditions that are at fault.

BLINDNESS AS A RESULT OF INFLAMMATORY DISEASE AFFECTING CONJUNCTIVA AND CORNEA.*

By COLMAN WARD CUTLER, M.D.,

NEW YORK CITY.

TOTAL blindness is rare in diseases of the conjunctiva and cornea, and, happily, the ignorance and neglect to which it has been so often due are giving way to the dawn of a day of concerted action in which large numbers of kindly people are striving to help the women and children and to instruct the unfortunate and selfish or the vicious and to arouse in them a sense of their responsibility.

Partial blindness is far more frequent and has not yet received adequate treatment.

Defects due to scars from keratitis of various kinds exert a decisive influence on the lives of many.

Phlyctenules with the suggestion of a probable tuberculosis are very common and the proper hygiene needed to prevent their recurrence in children of the poorer classes is beginning to be realized.

Reference may be made to the admirable reports of the social service work at the Massachusetts Charitable Eye and Ear Infirmary, and especially to the investigations conducted by Henry C. Greene; also to the work of the Committee on Blindness of the New York Association for the Blind, to the courtesy of whose sec-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

retary the writer is indebted for an introduction to this phase of a subject in which he has long been interested.

Sydney Stephenson closes his very able and complete monograph with the famous aphorism of Hermann Cohn: "Die Blenorrhœa neonatorum kann und muss aus allen civilisirten Staaten verschwinden."

The progress that has been made during the last decade in the prevention of blindness from ophthalmia neonatorum has been due chiefly to the energy of laymen. The literature which has grown very rapidly in the last few years shows the zeal and the resources of societies and committees and individuals trained for the admirable work of social service, but with a few honorable exceptions the medical profession has had small part in this campaign of preventive medicine. We have busied ourselves with the care of the individual cases and our attention has been directed to the questions of treatment rather than to the larger problems which interest the community and which are beginning to open a way to the root of the evil.

It is time to take a broad view of the situation and to join in the team work, without which no real progress is possible.

Trustworthy statistics are difficult to obtain. We know, however, that many cases of gonorrhœal ophthalmia in children still occur and that the blind whose sight might have been saved are still with us.

Two measures, if they are enforced, will suffice to make ophthalmia of the new born as rare as leprosy and its existence will become as abhorrent, and with far better reason. These measures are:

First.—The mandatory reporting of all cases of red and secreting eyes in infants to the local board of health, and the energetic investigation and following up of those that are not stated as having been put at once in competent hands; and

Second.—The mandatory use of a satisfactory prophylactic at birth or a clear statement by the physician in charge of the reason why this was omitted.

Such laws exist, but they are not universal or they are not enforced. In Massachusetts there is a good law, applying to midwives and to physicians alike, which has been emphasized by the prosecution and punishment of several physicians. This law, requiring the reporting of all cases of ophthalmia neonatorum, was passed in 1905, but only in 1910 was it enforced. Then the Boston Board of Health obtained the conviction of a physician. "The month before the conviction, the number of returns under the law had been 10; the month after the number was 20. The next month, there being no more prosecutions, the number fell back to 10; but in December new prosecutions were successfully carried through, and the returns rose during the next four months to 15, 32, 97 and 116, respectively. The last figure seems to represent a fairly thorough en-

forcement of the law and is being maintained." (Henderson, Boston Common, October 7, 1911.)

The same author states: "The enforcement of the reporting law, however, is the least important part of the Boston Board of Health's preventive work. Every reported case of ophthalmia neonatorum is immediately followed up by a competent nurse who sees to it that proper treatment is given the child and that, if necessary, it is sent to the hospital.

"Since the institution of the 'follow up' system in Boston, not a single known case of the disease has resulted in blindness."

In New York, the "Howe law," based upon a recommendation of the American Ophthalmological Society and enacted in 1890, marked the beginning of preventive work in this country. It applies only to midwives, but half the births are attended by physicians, and if the amended Boston law of 1905 were followed, many more cases of ophthalmia would be reported and undoubtedly some of the blind infants would be spared.

According to the Sanitary Code of New York City, physicians and hospitals are required to report cases of trachoma and suppurative conjunctivitis (San. Code, Sec. 133, 140), but it has not been enforced. It is stated officially, however, that this is to be enforced.

The report must be prompt to be effective. A recent state law requires that a notification of all births shall be returned within 36 hours, by every physician and midwife, in which it is stated what prophylactic was used, and on the certificate of birth the question is asked: "What preventive for ophthalmia neonatorum did you use? If none, state the reason therefor." New York, Buffalo, Albany and Yonkers are exempt from this law.

A digest of the legislation of this country may be found in Public Health Bulletin No. 49, by J. W. Kerr, Assistant Surgeon General, "Ophthalmia Neonatorum, An Analysis of the Laws and Regulations Relating Thereto in Force in the United States." Many of these laws are good in part; few are perfect. It is impossible to review them here. In Indiana and North Dakota provision is made in a law whereby all birth certificates shall have thereon the question, "Were precautions taken against ophthalmia neonatorum?" and failure to answer the same renders unlawful all bills or charges for professional services in connection with the case.

In the larger cities the enforcement of these laws is practically impossible without the cooperation of all physicians, which has been gained very effectually in Massachusetts, as has been stated.

All cases of ophthalmia should be reported at once; the "follow up" system should be carried out by the board of health, and a suitable prophylactic—preferably nitrate of silver 1 per cent.—should be used in all cases by midwives and in most cases by physicians.

To report all cases of red and secreting eyes,

and to apply nitrate of silver to all eyes at birth, must, then, be a matter of routine, so that the occasional cases of gonorrhoeal infection shall not escape. For this reason the name ophthalmia neonatorum has practical value, although it does not permit scientific deductions as to the prevalence of the gonorrhoeal type of the disease.

It would be interesting and valuable to examine every case bacteriologically, but it is more important to treat promptly and effectively every suspicious eye. Results are needed even more than statistics.

Dr. Cragin reports 66 cases of ophthalmia neonatorum in one year in the Sloan Maternity Hospital, but only one case showed the presence of gonococci. No wonder the treatment with 20 per cent. argyrol (as is the rule in that hospital) is effective in such a class of cases. On the other hand, at the New York Foundling Hospital no cases of ophthalmia neonatorum in the maternity service are recorded in the past year, because only the cases in which gonococci are found are considered important. Nitrate of silver, 1 per cent. sol., is used at birth. In the hospital, however, 52 cases of gonorrhoeal conjunctivitis were treated in 1910 and 41 cases in 1911. No eyes were lost and I am convinced that if a child is seen before the cornea is involved, prompt and vigorous treatment with nitrate of silver 1 per cent., or, in the more threatening cases, 2 per cent., will always save the eye. These cases, with few exceptions, were brought in as foundlings and it was usually impossible to trace their origin or to determine their exact age. The mortality among these children is very high and the problem of maintaining their vitality is often more difficult than that of preserving the eyes.

At present two children in the hospital—one a month old and the other two years old, both with gonorrhoeal vaginitis—have developed a severe gonorrhoeal conjunctivitis. In both cases the vaginitis was so slight as to escape the attention of the nurses, but there could have been no other source of the conjunctivitis.

It is obvious that it is impossible to generalize in the face of such diverse data. We cannot afford, however, to rest complacently at the beginning of the great campaign, nor to close our eyes to the prevalence of gonorrhoeal conjunctivitis as a late infection in children, as well as in the new born.

Late ophthalmia, that is, conjunctivitis appearing after the first week, is probably more frequent than has been believed. Dr. Whitridge Williams writes that he has examined the record of 2,000 cases at Johns Hopkins Hospital, 1,000 being cared for in the hospital and 1,000 by the out patient department. All cases had received 1 or 2 per cent. nitrate of silver in the eyes immediately after birth. To quote Dr. Williams' words: "I find that of the 1,000 cases in the out patient service 2 developed gonorrhoeal ophthalmia, and of the 1,000 hospital cases, 10 developed true gonorrhoeal ophthalmia." This gives

a total of 12 cases out of 2,000. It is of interest to note that in 7 of this number the symptoms first appeared on the eighth day or later. Dr. Williams stated that he believed that if the total number of out patients had been followed up more than eight days the proportion would have been larger. This would show that many cases which have remained in maternity hospitals only a week, or which have not been seen by the physicians later, may still develop ophthalmia from careless nursing after birth. It has been stated by many earlier observers that the late cases are only seen by the ophthalmologist, and not always by him, because of ignorant parents who are loath to bring their children to the dispensary or to seek treatment, and because the cases have already passed beyond the attention of the obstetrician. It is recognized also that these secondary cases are apt to be more severe and more threatening than the cases of true ophthalmia neonatorum.

It is probable that many of the children brought to the hospitals with gonorrhoeal ophthalmia—not all—were brought into the world by midwives, and so long as women without training, often illiterate, are permitted to assume such grave responsibilities, so long will the deplorable evils continue, and for this the intelligent classes, and especially the medical profession, should be held responsible.

In 1910 the New York City Department of Health issued permits to 1,344 midwives, who reported 40 per cent. of the births, and it is stated that 50 per cent. of all births throughout the country are under the management of midwives, and no obstetricians or lying in hospitals could fill their places among the foreign born classes of our population.

In 1912 a staff of five physicians and eight nurses has been appointed to supervise the work of the midwives, but the evil is deeper. No examination or educational standard is imposed upon these women who are allowed to assume the duties of a physician and of a trained nurse. There is no compulsion or inducement offered for midwives to enter schools for training, because their self-respect as a profession has not been sufficiently developed.

A question arises which it is difficult to answer. The number of midwives registered in New York is 1,344. Does this include all the women who practice midwifery? It is stated that at least 2,000 women are engaged in this business—it is not right to call it a profession under the present conditions—and is it possible for them to avoid reporting cases without detection? It is to be feared that some physicians are willing to sign their birth certificates for a consideration.

A small school for midwives has been established in connection with Bellevue Hospital. It is admirable, but it is only a beginning. Training should be provided and made compulsory on an adequate scale, under state control, if the profession of midwifery is to be tolerated. This

has been done in other countries and our attitude is disgraceful.

These brief allusions to large subjects show how necessary it is for all members of the community to work together if the desired ends are to be attained. Legislators, physicians, nurses, social workers, all have their part in the "team work" and the community is taking an ever increasing interest.

From what has been said we are justified in drawing the following conclusions regarding the importance:

First.—Of enforcing the use of nitrate of silver by midwives and, if possible, by physicians, at birth.

Second.—Of recognizing and treating all cases of severe conjunctivitis in young children, and the enforcement of laws relating to reporting and following up.

Third.—Of classifying, when it can be done without delaying treatment, into

a. Gonorrhoeal.

b. Non-gonorrhoeal.

1. Conjunctivitis of the new born.

2. Conjunctivitis after the first week.

3. Conjunctivitis of adults.

This should be done as a matter of record in institutions and by boards of health, but the treatment should never wait for the smear.

Fourth.—Of reporting of all cases of venereal diseases to the boards of health, so that reliable data may be obtained, as has been done in tuberculosis. This is already required in certain states.

Fifth.—Of the agitation of the midwife question until their training and examination are assured.

BLINDNESS FROM TOXEMIA.*

By ARNOLD KNAPP, M.D.,
NEW YORK CITY.

IN a consideration of the non-bacterial toxic affections of the retina and of the optic nerve the causes may conveniently be divided into endogenous and exogenous. The ophthalmoscopic changes and functional findings are often characteristic of the retrobulbar type of optic neuritis. In the former or endogenous group the character of the poison is unknown and the condition is said to be due to faulty metabolism. Of the metabolic disturbances diabetes is perhaps the best understood.

In diabetes the optic nerve may suffer under the picture of chronic retrobulbar neuritis. There is a gradual loss of sight and in some cases the scotoma is paracentral. It occurs in older patients who are in very poor general health or are in the later stages of the disease. Cases of sudden blindness (acute retrobulbar neuritis) have been reported (Forster quoted by Grœnouw, Graefe Saemisch 2d ed.).

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

There is a form of chronic retrobulbar neuritis which occurs in older people where a careful general examination has only revealed some chronic nephritis of moderate severity, and where tobacco and alcohol poisoning could be excluded. In two cases which I had the opportunity of observing this condition was associated with chronic glaucoma.

Uremic amaurosis is a well recognized form of toxic blindness in acute or chronic nephritis. Its transitory nature, the absence of ophthalmoscopic changes and the presence of cerebral symptoms point to its being a disturbance of the cerebral visual center.

In pregnancy and during labor peculiar disturbances of vision have been observed which are transitory or more or less permanent. The optic nerves are sometimes atrophic and a central scotoma has been noted. These cases often present severe headache, hyperemesis gravidarum and eclampsia and they with the eye symptoms are all regarded as evidences of a toxemia of pregnancy. A similar ocular change occurs in lactation; the ocular symptoms according to Grœnouw occur not only in unduly prolonged nursing or where the milk has suddenly ceased but in apparently normal lactation. This condition can best be explained by the continuation of the causes for a toxemia of pregnancy.

In carcinoma cachexia, just as multiple neuritis sometimes develops, the optic nerves may be affected in the form of retrobulbar neuritis (Uhthoff).

Visual disturbances are very much more frequent in the exogenous group and the exogenous intoxications have been subjected to thorough clinical and experimental investigations. Of the many poisons which seem to exert a selective action on the retina and optic nerve I shall only speak of the two, wood alcohol and the organic arsenic compounds which have recently been receiving a great deal of attention.

Methyl or wood alcohol is taken by mouth, inhaled (varnishing of beer vats) or absorbed by the skin (alcohol rub). After symptoms of gastro-intestinal irritation, sight is lost. Pronounced ophthalmoscopic changes at first are rare. There may be a temporary improvement and the sight again fails. The prognosis is bad though sight is sometimes regained to quite an extent, for which, in my experience, treatment is not responsible. The inhalation cases apparently do best. The atrophic optic nerve sometimes shows later a remarkably distinct excavation.

The organic arsenic compounds include atoxyl, soamin and arsacetin. The frequency with which these have produced optic atrophy when given in the course of treatment for syphilis, relapsing fever, sleeping sickness and

in certain skin diseases, has caused an abandonment of their use. Coppez (Trans. Eleventh Int. Congress Ophth. Naples, 1909, quoted from *Ophthalmic Literature Mo.*) believes the anilin to be the cause of the toxemia. Collins and Mayou (*Pathology and Bacteriology of the Eye*) state that this unfortunate effect is not the result of arsenical poisoning as cases of optic atrophy in arsenical poisoning and after the administration of salvarsan are not known and that the anilin part of the arylarsonates must be regarded as the poisoning factor.

Discussion.

DR. LUCIEN HOWE: During the very few minutes allotted to this discussion it is evidently impossible even to mention the more important causes of blindness. Therefore, it seems better to confine my remarks to blindness from diseases of the conjunctiva, or especially to that from ophthalmia neonatorum.

It is evidently impossible here to consider the relative frequency of infections from the gonococcus or other bacteria, but we all agree that gonorrhœa is by far the most important cause of blindness in children, and perhaps greater than any other cause also of blindness in adult life.

Also, we have apparently made comparatively little progress in lessening the blindness caused by gonorrhœa. The overshadowing importance of that disease as a cause of blindness was pointed out in this country more than twenty years ago by a committee of the American Ophthalmological Society.

During that time we have at intervals been repeating the same figures, giving the same admonitions to other doctors, to midwives, to the laity, and making many efforts to prevent infection when the germ is present, and especially to cure the disease after it has developed. But the fact is that the reports of three of the largest eye hospitals in New York recently showed only about a half of one per cent. less of these cases than formerly, and the percentage of blindness from gonorrhœa in asylums in New York State is practically the same as formerly. It is true these sources are not entirely reliable, but the data from them are significant.

Now, the third point which I wish to make, and the only excuse for my occupying any time on this subject is to repeat what has been said by myself and others before, that the best way to prevent blindness is to prevent gonorrhœa. That can be done and it should be done. Sanitarians are no longer occupying their minds so much with results as causes. Instead of trying to stem this tide after it is in full flood they have agreed that the real way is to shut off the supply at the source. It would be far beyond the limits of this discussion to show how that can be done, but thoughtful men and women, too, are now joining in a crusade against this black plague.

They are banding themselves into societies

known generally as for sanitary and moral prophylaxis, and into similar societies all over the land.

The question which comes to you and me and every ophthalmologist is simply this, shall we not, in fact, should we not join in that crusade actively and energetically as the leaders? Not be content to show what the results are, but what the principal cause is. Let us show how this cause can be lessened by proper instruction of children who have reached the age of adolescence, by suitable sanitation; in a word, cut off this plague at its source, and in this way prevent blindness instead of trying to treat it afterwards. Each one of us usually makes about the same speech and writes about the same paper on about the same subject. This is the lesson that has come to me and which I try to repeat in the few minutes allotted to me in this discussion.

DR. CHARLES H. MAY: I agree with Dr. Howe that this subject is one which cannot be considered very extensively since there would not be sufficient time. Hence, I will limit myself to a discussion of a few of the points brought out by the readers of the papers. Regarding purulent ophthalmia, as far as New York City is concerned, the opinion is pretty generally accepted and every ophthalmologist's experiences seem to confirm this, that much fewer cases of this disease, both the newborn and adult types, are encountered than was the case ten years ago. It is also true that the prognosis is much better, and that among the cases which are met with and treated a much smaller number result in corneal involvement with subsequent impairment of vision. To be sure, the percentage of cases of blindness in the institutions for the blind of this state does not show much change from the proportion present ten years ago. This is due to the fact that too short a period has elapsed since we have reduced the percentage and the disastrous results to permit of any marked change or lessening in such statistics. In five or ten years from now statistics will undoubtedly show a very decided falling off in the percentage of cases of blindness due to purulent ophthalmia. Improvement in this condition has been brought about, first, by continued discussion and teaching of the subject on the part of the medical profession; second, through the interest shown by various lay societies, resulting in active steps to have the laws requiring the report of these diseases to the local boards of health enforced; and third, as a consequence of the education of the public on the subject of sexual morality and the dangers of venereal disease. These have undoubtedly produced marked lessening in the prevalence of purulent ophthalmia.

It is unfortunate that just when such progress has been made and we have become convinced that in solution of nitrate of silver we have an agent which can be relied upon as an effective prophylactic, there should arise the question of

substitutes in the shape of argyrol or other organic silver preparations which, through clever advertising, have been put forward as having advantages over silver nitrate. Whatever uses these organic preparations of silver may have under other circumstances and as adjuvants, ophthalmologists are pretty well agreed that as prophylactic agents for the prevention of ophthalmia neonatorum and as real disinfectants at certain stages in the treatment of purulent ophthalmia of adults, they are inferior to nitrate of silver.

Regarding the blindness due to intraocular disease, there is no doubt that some progress is being made in reducing the loss of vision in such cases; but there is certainly much left to be desired, for we see many instances in which we are unable to find a satisfactory cause of intraocular disease and are impotent to arrest the course of an inflammation which ends in blindness. I believe that a good deal of the progress in the future will lie in the direction of the discovery of vaccines and serums which will prove useful in combating these diseases; and I do not consider it at all improbable that at some time in the future it will be considered justifiable to perform an exploratory paracentesis of the anterior chamber for the purpose of obtaining a specimen of the aqueous for examination, to aid in diagnosis and for the preparation of a vaccine or serum.

Concerning that portion of Dr. Knapp's paper which referred to the loss of vision due to wood alcohol, I have had some experience with patients suffering from the effects of this poison, having recently had six or seven such cases under observation in my service at the Mount Sinai Hospital; these have presented the best results when treated with amyl nitrite, sodium nitrite and nitroglycerin. Although I received the impression that these remedies acted better than any others, I am not prepared to say from observations of so small a number that these agents were entirely responsible for the improvement in vision; I am rather inclined to believe, agreeing with Dr. Knapp, that a limited amount of improvement in vision occurs in some cases independent of medication.

DR. COLMAN WARD CUTLER: There is no question but that we are gaining ground, but there is much to be done and there is danger in a growing complacency.

In gonorrhoeal conjunctivitis total blindness is no longer the main question. The cases with defects of vision are more difficult to estimate, but they are frequently of great importance in the crowded trades and professions.

Phlyctenules are enormously frequent and important. I see five or ten cases of corneal phlyctenules to one of gonorrhoeal conjunctivitis.

In Boston social service work has been wonderfully developed and it has been found that by the agency of nurses going to the homes of the children their hygiene may be so improved that the recurrent attacks with renewed danger to the

Corneal transparency may be avoided. The greater responsibility of physicians as opposed to midwives may well be emphasized. This has been found to be true in Massachusetts and in New York.

The warning against a reliance on argyrol is well spoken by Dr. May.

Since I have used nitrate of silver daily, with argyrol every two or three hours merely as an adjuvant, the results have been greatly improved.

SOME OCULAR OBSERVATIONS IN BRAIN TUMOR.*

By SHERMAN VOORHEES, M.D.,

ELMIRA, N. Y.

THE eye undoubtedly holds for the clinician generally more evidence of brain tumor than any other one organ. This is largely so because of its intimate connection with and its proximity to the central nervous system, and from the fact that the second nerve is invested with the same meningeal coverings and separated by the same lymph spaces as that of the brain and derives its blood supply from an intracranial source, making it in reality a prolongation of the encephalon.

Formerly but little was expected of the ophthalmologist but to pass upon the condition of the optic nerve and to determine whether or not a papillary œdema was present. Gradually we have learned that there are many other evidences of cerebral neoplasm other than œdema of the disc and that by collaborating this early evidence together with other of the neurological symptoms and signs a diagnosis can many times be reached before an œdema of the nerve head takes place or before there is increase enough in the brain pressure to cause either a true mechanical or an inflammatory edema of the nerve or both. I say both advisedly, as some observers hold to one and some to the other view as to the origin of the swelling. From my own clinical observations I am inclined to believe both processes are present in some cases. But that back of every œdema of the papilla we have its start in the increased brain pressure and consequent distension of the lymph spaces covering the nerve, and by pressure upon the vessels we have first an obstructive venous circulation and a consequent rise in venous pressure, making the veins more prominent and tortuous, and later an œdema about the vessels, and then to the rest of the structure. The nerve as it leaves the cranium carries with it two layers of dura. As it emerges from the optic foramen the upper layer becomes continuous with the orbital periosteum and the other layer covers the nerve to the sclera, with which it becomes continuous; the subarachnoid and pia also send prolongations over the nerve, the pia sending delicate trabecular tissue through-

out the nerve through which the nerve fibers run and in which they are supported.

The central artery enters the optic nerve about 15 mm. behind the ball in man, and much closer to the sclerotic in lower animals. This artery is accompanied by the vein and a very delicate plexus derived from the ciliary nerves, sometimes known as "Tiedemann's nerve." The vein usually lays behind the artery and the plexus surrounds it. The vessels soon gain an axial position within the nerve, where they are surrounded by a sheath of connective tissue. Dyle found in twenty-one orbits examined by him the central vessels entered the nerve, in every instance, in the inferior nasal quadrant. As this is the situation of the optic fissure of the embryo it appears that the vessel maintains its primitive position. According to Norris and Oliver, the arteria centralis retinae enters the nerve some 1.5 cm. behind the eye ball and runs within it as far as the fundus of the excavation of the disc. This excavation is not situated at the center of the disc, but somewhat toward its nasal side, where the walls of the excavation are somewhat steeper and where the retinal vessels are found, they having penetrated at the bottom of the funnel. Within this excavation it usually divides into two branches. I recite these well known anatomical facts in part to see if they do not have some bearing upon the swelling of the papilla.

In examining eyes in which this excavation is shallow I have been impressed with the frequency with which the vessels seem to enter the eye a little to the nasal and upper side of the disc. Although authors tell us it enters at the center, the vein lying to the nasal side, when there is a deep excavation, it is difficult to say exactly what its position is.

In several cases of brain tumor that I have had a chance to observe, just at the beginning of fundus changes, I have observed the first swelling was not in the physiological cup but occurred underneath the superior vessels to quite an extent first, and to a less degree under the inferior vessels, there being no swelling of the disc edges between these two points and only redness of the remainder of the disc, with characteristic changes in the veins of the retina. However, most writers say the first swelling appears in the cup, and this I have observed also in several instances.

It has suggested itself to me that perhaps frequently the vessels in the nerve did not occupy a true axial course, but were nearer to the nasal and upper side, and that the vessels, especially the vein, were thereby subjected to an earlier pressure sufficient to cause œdema than the rest of the nerve. It is, I think, significant that the inferior temporal quadrant, that has less large vessel supply, is usually the last to take on swelling, and following decompression and consequent release of pressure, is the first to clear. This, I think, is shown in the following case:

Woman of 64 years has had vertigo and staggered in walking, and several times has fallen,

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

was deaf in left ear, had beginning neuritis in right eye, chiefly to nasal side, veins were somewhat distended and tortuous, the outer temporal quadrant was clear but slightly reddened, under the vessels as they emerged from the disc there was 1 d. of swelling, the nasal side somewhat obscured, and soon showed 1 d. About nine-tenths of the disc showed swelling, which was more pronounced about the vessels, but at the lower outer quadrant there was a decided clear area which did not take on actual swelling until later. However, soon the whole disc showed 3 d. of swelling. The left eye at first showed no visible nerve change except some extra redness of the nasal side and some tortuosity of the veins with distension. And the neuritis, which I watched from day to day until it measured 3 d., began to the nasal side and first about and under the vessels, and the lower outer quadrant was the last to take on such œdema. The color fields were taken on her first visit and had the typical interlacing as described so graphically by Cushing and Bordley. A diagnosis of cerebellar tumor was made, a subtentorial decompression was done, the cerebellum was found to be under high pressure and a large cyst was evacuated. The œdema of the disc subsided rapidly, the swelling first disappearing from the temporal side, and that about the nasal side and about the larger retinal vessels was the last to disappear. The patient has at present only congestion of the discs and with glasses has 20/15 vision.

Another instance, a woman of 30, with specific history, has had headaches, vomiting, nausea and vertigo the past four months. She had vision each eye 20/20, pupillary reflexes normal. Conjunctival and corneal reflexes present and normal. Right disc has swelling into physiological cup and upper nasal side about vessels of 3 d., gradually shading off as it approached the inferior border of the disc; inferior temporal quadrant was clear, but reddened and soon showed haziness about the edge. The left eye had 5 d. of swelling and all margins were obscured, but no hemorrhage had taken place. Her color fields interlaced. She had a direct specific history, but Wasserman reaction proved negative four times. A right suboccipital decompression was done with rapid subsidence of the œdema and the swelling was noticed to disappear first from the inferior temporal quadrant. At the last examination there was 2 d. of swelling in the left eye in the upper nasal quadrant and in the nasal side of the cup. The right eye, however, cleared up entirely. In this case, there was some difference of opinion among the men engaged on the case as to the side of the lesion, the ophthalmologist thinking it was located on the left side and the neurologist on the right. At operation for decompression no tumor was found and the fact that the left eye was the first to take on choked disc and has not entirely subsided following release of pressure makes me feel the operation was done on the wrong side. So I am not so sure but we

can lay down this rule (that following decompression with failure to locate tumor as to side, the eye retaining the œdema of the disc indicates the side of the lesion). However, that perhaps is of little consequence, as the surgeon, if he don't find it at operation on the right side, at the next operation will explore the left anyway. Following decompression in this case, her color field in right eye returned to normal and but little defect in left eye.

I believe the color field is important to study in tumor of the brain, especially before visible change exists in the fundus, but do not believe it is of sufficient weight to be depended upon in the absence of other ocular symptoms. However, in tumors involving so-called silent areas and in which we get no early ocular signs I think it should not be lightly considered. If, however, we begin to examine all our cases that come to us complaining of headache and dizziness and in which we find no fundus changes nor ear changes to account for the symptoms and take the color field, we are surprised to find how many cases have interlacing or inversion. For a time I began to think by this test alone that I had numerous brain cases. But as we are well aware, this inversion and interlacing occurs in hysteria and several other conditions, so that its value lessens somewhat because of these facts.

Another case which, I think, illustrates my point is the following:

A woman of 25 consulted me because of severe headache and momentary loss of vision and nausea. For six years past she had been a great sufferer from headaches, which attacks varied in intensity, but for the past few months they had been much more severe than ever before. She was very slow to comprehend questions, but usually her replies were clear. Vision in each eye was 20/15, under mydriatic the same. Color fields not taken. The right disc had swelling, chiefly under the superior and inferior retinal vessels. As they emerged from the nerve head this swelling amounted to plus 3. In the right eye it shaded off rather abruptly and the rest of the disc margin could be clearly seen, but the whole disc reddened. The left eye showed plus 2 d. swelling, and chiefly under the vessels, and the remainder of the disc margin could be clearly seen. In the left eye there was a slight hemorrhage to the outer side of the disc where a vein crossed an artery. There was no nystagmus. Ear tests were negative. The next day I again saw the case with no change in the eye condition. In one week I was called to her home, found her in bed only semi-conscious, both pupils widely dilated and did not respond to light, both discs were choked and had 7 d. of swelling with large hemorrhages throughout the retina and ptosis of right eyelid, pulse of 50, and temperature 98. Three days later complete ophthalmoplegia took place in the right eye and paralysis of external and internal rectus of left eye. Both eyeballs were prominently bulging and the clinical pic-

ture suggested cavernous sinus thrombosis, but there was no sub-conjunctival hemorrhage. The patient died in a few days. Autopsy showed a large tumor of left temporal lobe. In this case the swelling just under the vessels was very striking and showed a clear disc edge, and if there was not an increase of pressure on the vessels by some anatomical arrangement of the tissues or by some anatomical anomaly, then I am at a loss to understand why the whole disc or at least the nasal side should not have taken on swelling simultaneously with the tissues under the vessels.

The following case is of interest and illustrates the value of decompression when there is double optic neuritis with no localizing symptoms:

Man, age 20, occupation laborer. For four months had noticed did not see as well as usual; has not been dizzy nor had nausea, nor any headaches. Vision R. 20/100, vision L. 2/200, by turning head sharply to right side. Eye reflexes present and normal. Right disc shows swelling into physiological cup and chiefly to nasal side; temporal side of disc is plainly seen at edge. Veins are distended and increased in tortuosity. Left eye had about the same condition, and swelling into the physiological cup but none into vitreous. There was para central scotoma in both eyes and a beginning atrophy, especially of left disc. There was at times only a slight nystagmus, together with a tremor of the head, on turning to the left side. He was referred to a neurologist, who reported he could find no localizing symptoms. After some weeks' delay it was decided to release the brain pressure by decompression and there being no indication that the disturbance was subtentorial, it was decided to decompress in the right temporal region; this was followed by a rapid subsidence of the swelling in both eyes and, later, atrophy. But the patient, while he has no color perception, can get about readily and seems to have no increase of his central trouble. Probably here we have a lesion of a silent area giving no local symptoms, and I think it argues well for Horseley's theory that where there is papillary oedema present in both eyes with or without localizing symptoms, to decompress.

A BRIEF REPORT OF THREE CASES OF FAMILY PERIODIC PARALYSIS.*

By CHARLES E. ATWOOD, B.S., M.D.,

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IN the time allotted for presentation it is impossible to give more than a brief report of my cases. Family periodic paralysis is a rare disease. Its pathology is unknown. As its name indicates, it is hereditary, occurring in successive generations of a family. It is char-

acterized by periodic attacks of motor paralysis, flaccid in type, associated with a temporary loss of tendon reflexes and of electrical excitability, and is unaccompanied by sensory or psychic disturbance of any sort. Attacks usually begin in childhood. They come on at night or after prolonged rest in bed. There may or may not be prodromes. Paralysis lasts for a few hours or for several days. In severe attacks all four extremities, the trunk and the neck are affected. The cranial nerves usually escape. Cardiac enlargement with a systolic bruit occurs during severe attacks in some cases, disappearing with the other phenomena between attacks. Intervals between attacks vary from a few days to years. Attacks cease at the climacteric. Their frequent association with errors in diet, constipation and faulty metabolism has led to the acceptance by many of the belief in an autotoxic basis for the attacks. There are a number of other theories. Treatment has, however, been of little avail.

Three cases of family periodic paralysis were carefully examined by the writer and one case is reported more in detail. There were nine cases altogether in the same family, in four generations, all on the maternal side. The disease was transmitted through both males and females. Those affected were two brothers, their mother, the mother's brother, two of the grandmother's sister's grandchildren, two of the great grandmothers' sister's children, and the great grandmother's brother. All were typical cases. The maternal grandfather had asthma; the mother migraine; a second cousin choked to death during an attack, from vomited matter which he was unable to clear from the throat. Another cousin died in an attack when a vein was opened to obtain a specimen of blood. One affected *brother*, aged 21, has had only one attack, at 19. He awoke with complete flaccid motor paralysis lasting about an hour; but he was not fully recovered until the next morning. The *mother*, 41, has had four severe attacks, *viz.*, at 17, 19, 32 and 37. Each attack lasted 24 hours, and affected all four extremities, trunk and neck. She awakened each time paralyzed. She has had milder incomplete attacks, once to four times a year. In these, the legs were usually affected; sometimes also the arms; sometimes only the fingers. All her attacks have followed errors in diet. The affected *uncle*, aged 45, has had three attacks at intervals of about five years. A second *cousin* has attacks about one or twice a year, following over-eating on certain holidays. Another *relative* had attacks for ten years at intervals, early in life, but lived to be seventy. For a year he was under continuous observation in Vienna. Attacks of antecedents began early in life, and ceased at or before the climacteric.

Case reported in detail: Boy of 18. Russian Hebrew. Had measles only. Between attacks is well except for constipation, large tonsils, and adenoids. Is bright, active and strong. Muscular build. Large quadriceps, especially vasti

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

externi, suggesting an associated dystrophy. This has been found in a few cases by others. Dystrophies in these cases must be associated conditions, as the paralysis recovers later on. There was no dystrophy in the other cases of paralysis examined in this family. That it should appear at all in a disease attended by flaccid paralysis is interesting. Between attacks neurological examinations were negative. Patient's first attack of paralysis occurred at 4; the second at 12; the third at 14. Since 14, severe attacks occurred at one time once a week, every Thursday; later, once in three to six weeks; minor attacks were frequent. Severe attacks are typical, comprising a flaccid motor paralysis of the legs, arms, trunk and neck, without apparent involvement of the cranial nerves. Special features in the case: Chronic constipation. Attacks follow errors in diet and emotional excitement. Attacks are more frequent in winter. Severe exercise does not produce attacks. Prodromal symptoms often occur, *e. g.*, feeling of heaviness and weakness in the legs. The onset of attacks is between midnight and dawn. The patient awakens paralyzed. If the paralysis is at first incomplete the proximal muscle of the legs are first paralyzed before the distal, then the arms similarly, and lastly the trunk and neck. Muscle and nerve irritability is lost; reflexes, deep and superficial, are lost. These all return with return of power. There is a temporary mitral systolic bruit of the heart. The rectal sphincter is involved only in severest attacks; then micturition is difficult; and the voice is less strong. Swallowing is accomplished; but everything taken on the first day is vomited. Vomiting, coughing and sneezing are difficult. There is no pain; no disturbance of consciousness; no paræsthesiæ; no disturbance of sensation or muscle sense. The intensity of paralysis varies in different attacks. Improvement may occur during an attack with subsequent greater onset and return to complete paralysis. The duration of severe attacks in this case is from a few hours to three and a half days. A severe attack followed masturbation on one occasion. Erections with libido lasting about five minutes occur in severe attacks, sometimes two or three times, causing embarrassment when he is turned in bed. Moderate sweating occurs, but there is no thirst. If placed in an erect or sitting posture during an attack, patient faints.* Urinalyses during attacks showed increased acidity, increased indican, a little albumin, increased sulphate partition. Bacteriological study of feces showed a marked intestinal infection of the bacillus *aerogenes capsulatus*. The same condition was found in the affected mother and brother, in a lesser degree; and also, to a slight extent, in the father, who is unaffected by the disease. Treatment has been by elimination. Mild diuresis by potassium citrate, mild catharsis, hygiene and increased

meat diet have apparently rendered attacks milder, less prolonged, and less frequent. Vaccines might be tried. Colonectomy (Lane method) has been thought of, but scarcely seems justifiable. Attacks are probably due to the circulation of some toxic agent acting upon the periphery. Heredity induces a susceptibility and may account for a vitiation of glandular structures which have to do with metabolism.

Discussion.

DR. ANTHONY BASSLER: I am not in a position to discuss Dr. Atwood's paper from a neurologist's standpoint, because the case he sent me for laboratory study was the first I have ever seen and my knowledge of the literature on the subject is meagre. In that boy it was interesting to note that he had a very high infection of the intestines of the *B. aerogenes capsulatus*, the highest I have ever seen. These were found as many as fifty to one hundred in a field, and what is further interesting in the specimens is that many of them had spores and were undergoing active spore relation, a condition never seen in raw stool specimens. I feel in this case that the bacteriology of the stools was distinctly pathological but as to whether that had to do with the etiology of the condition I cannot say.

SPONTANEOUS FRACTURE AS AN INITIAL OR EARLY SYMPTOM OF TABES DORSALIS.†

By HENRY LING TAYLOR, M.D.,
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IT is only in the last two or three years that the writer has realized the comparative frequency of spontaneous fracture in individuals suffering from tabes dorsalis, and its importance as an initial or early symptom of that distressing malady.

So completely had this association been overlooked that it was not even mentioned among the causes of spontaneous fracture in the writer's *Orthopedic Surgery for Practitioners*.¹

The nine personally observed cases here reported, collected in the last three years at the clinics of the Hospital for the Ruptured and Crippled, the Post-Graduate Hospital, in private practice, and through the kindness of friends, are sufficient indication that spontaneous fracture in tabetics cannot be very rare; and the fact that in the first seven cases the practically *painless* fracture occurred before there was any disturbance of the ordinary gait, and had not led, so far as could be ascertained, to the diagnosis of tabes, is sufficient reason for calling attention to its importance as an early symptom of diagnostic importance. Seven of the nine cases gave a

† Read at the annual meeting of the Third District Branch of the Medical Society of the State of New York, at Troy, October 1, 1912.

¹ D. Appleton and Co., New York, 1909.

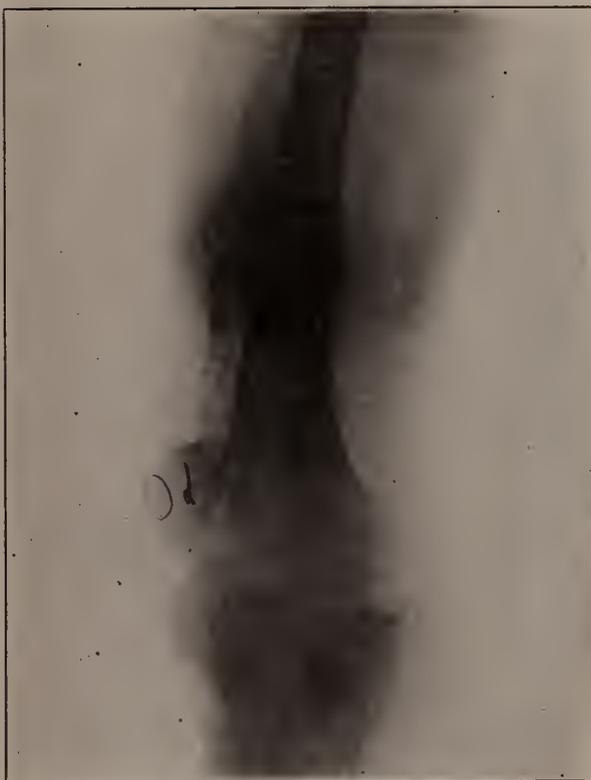
* Laboratory findings were by Dr. A. Bassler, of New York.

history of lues from 8 to 24 years before the fracture, but believed themselves to have recovered under treatment; seven at the time of the fracture were working at their ordinary occupations, and considered themselves well. The fracture was in each case produced by such activities as are, or may be, practiced daily without harm, by ordinary individuals. In each of the nine cases the fracture was painless or nearly so, and while the fracture was often slow in healing, all (except one not traced and one with a loose fragment) finally united, under rest and fixation, usually with a very large callus, giving a useful limb. Most of these cases had been treated for their fractures before applying for advice, and sought help for a stiff knee (i.), or complicating, or subsequent Charcot joint (ii., iii., iv., v., vii.). In these cases it was only by careful questioning or study that the preceding fracture was discovered. In several cases the fracture had occurred years before, and was discovered almost accidentally through the large callus or the history. Whether we shall call the fractures in the first seven cases *initial* or not will depend upon the meaning one attaches to that term. As absent knee jerks, pupillary symptoms, and Romberg's sign usually escape the patient's observation, and are only brought out by a medical examination, it must remain uncertain whether these symptoms were present or not before the fracture took place. In all the cases but two the patient had suffered from persistent but irregular, sharp, shooting pains in the trunk or limb, or both, before the fracture, and this would indicate that pains of this character are among the earliest striking symptoms of tabes and that careful attention should be paid to them in general practice. Adults, especially men, presenting this symptom should be carefully examined for tabes. In two cases ophthalmoplegia had also preceded the fracture. In two cases (v. and vii.), so far as could be ascertained, the patient was aware of no symptoms preceding the fracture. In the last two cases (viii., ix.), the patients had been markedly ataxic for years, and were known to be suffering from tabes. None of the first seven cases presented any ataxic gait at the time of the fracture except case vi., who was aware of some difficulty when walking in the dark. Several of the cases are still without the ataxic gait, though several years have elapsed since the fracture in some instances.

The relation of Charcot joints to tabes is similar to that of spontaneous fracture; they may be an initial or early symptom; they frequently result from fractures or lesser traumata, and are very amenable to orthopedic treatment. Crush fractures of the tibial tuberosities are especially liable to be followed by Charcot knees, though in old Charcot joints it must often remain uncertain whether the crush fracture was the cause or the result of the joint affection. The writer hopes to set forth his observations on Charcot joints in an early paper.

The bone changes leading to spontaneous fractures and Charcot joints in tabetics are as yet obscure. Skiagraphic examination does not usually disclose any decalcification or other gross structural changes in intact bones of tabetic subjects. It has, however, shown that the osteogenetic function after a bone lesion, is apparently increased. New bone is thrown out in large quantity about fractures and often about Charcot joints. Case I., showing a marked myositis ossificans of the rectus cruris, after a tabetic fracture of the patella, is interesting in this connection.

From the study of these cases, and others with Charcot joints, it would seem that ataxia or disturbances of the gait may be almost in-



CASE I.—Spontaneous fracture of the patella; crush of tibial tuberosity; myositis ossificans of rectus femoris.

definitely delayed, even when all or most of the other characteristic symptoms of tabes are present. Are there cases of tabes that never develop ataxia? As the symptom of ataxia may be a late or uncertain quantity, the name locomotor ataxia, by which tabes dorsalis is commonly known, is peculiarly unfortunate and misleading.

It should not be forgotten that some subjects of an ancient lues are subject to spontaneous fractures, even when they do not suffer from tabes. The history of such a case (X) is given near the end of this paper. Before giving the histories of the cases observed, the writer wishes to express his obligations to his friends, Dr. W. R. Townsend, Dr. George W. Hawley, Dr. Wal-

ter W. Strang, Dr. George Barrie, and Dr. Percy W. Roberts, of the staff of the Hospital for Ruptured and Crippled; to Dr. Robert T. Morris, Dr. Charles Ogilvy, Dr. Fred H. Albee, of the Post-Graduate Hospital, and to the radiographers of both hospitals for material furnished or for aid in the study of the cases.

Case I. *Spontaneous fracture right patella. Myositis ossificans of rectus cruris. Tabes.*

Man, 37, July, 1909. While going down a step, December 28, 1908, fractured right patella. There was no fall and no pain, but a great deal of swelling. The patella was wired two weeks later, and united, but the knee remained stiff. He had had no previous disturbance of gait, and considered himself well. He had had, however, pains in stomach and lower limbs for seven years. Examination showed knee reflex absent, and Argyle-Robertson pupils; no ataxia in gait. The skiagram showed patella united without exuberant callus, wires in place, new bony formation from one quarter to an inch thick in front of lower half of femur, and separated from it at its lower part by a clear interval; internal tuberosity of tibia enlarged and displaced; probably fractured at the same time as the patella. This man was re-examined May 29, 1912. He had a right out-knee, and walked with crutches, with great difficulty. He now has Romberg's sign, pupillary symptoms, absent knee reflex, and ataxic gait, also sharp pains at times in stomach and legs. His right patella is fixed, but he has a few degrees of loose motion at the knee.

Case II. *Spontaneous fracture left internal tuberosity of tibia. Tabes.*

Man, 42, September, 1910. Two years before, while sitting, jerked left foot up to head to show his agility. He felt and heard something give way in knee, which suddenly became loose and swelled to large size; had little pain. In August, 1910, he slipped in bath tub and again injured left knee, which again became loose and swollen, but not painful. A week later it was put up in plaster. In September, four weeks after the accident, he was still in bed with the left leg in a plaster splint. Previous to these injuries he had walked well, had had no symptoms, except occasional pains in the legs and stomach, and considered himself well. The skiagram showed a large piece chipped off the internal tuberosity of the tibia. Examination showed Romberg's sign, unequal and sluggish pupils, the left being large and irregular, and absent knee reflex. The diagnosis of tabetic fracture was made, and a fixation splint (Thomas caliper) advised. This was applied by his physician; the fracture united, the swelling subsided, and in a few months the patient returned to business. He died, however, about a year later.

Case III. *Spontaneous fracture of left femur. Right and left Charcot hip. Tabes.*

Man, 39, September, 1910. Iceman. Seven years before, while walking beside his wagon, felt something suddenly snap and give way near

his left hip, and fell to the ground. He was taken to a hospital, where a fracture of the shaft below the lesser trochanter was found, for which he was treated. The fracture united and he was told there was one inch shortening. He had never had any trouble in walking and believed himself well before this injury. Two years before, however, he had had shooting pains



CASE III.—Spontaneous fracture of shaft of femur seven years old; union with large callus; charcot hip.

first in right, and later in left thigh, and for a week before the accident he had had a burning sensation about the left hip, his left eye turned outward, and he saw double. Two years ago his right hip gave out and he began to have sharp pains in his stomach; since then he had gone about on crutches with great difficulty. Examination shows pupils immobile to light, left ptosis and outward deviation; knee reflexes absent; areas of anesthesia on trunk and limb; ataxia of legs. Both hip joints very loose; hard swelling left femur below hip. R. A. 36½ inches; L. A. 35 inches. Right trochanter two inches, and left three and one half inches above Nelaton's line. Radiograms show both femoral heads entirely gone, neck wholly absent on right and partly on left side. There is a very large callus projecting inward from the left shaft two inches below the neck; union firm.

Case IV. *Spontaneous fracture left femur (twice). Right Charcot knee. Tabes.*

Man, 50, November, 1910. In June, 1909, broke shaft of left femur above the middle while



CASE IV.—Spontaneous fracture left femur, two places, one and a half years before; union with large callus.

bowling. He was in bed six weeks and he says the bone united with three-quarter inch shortening. Seven weeks later, while walking on crutches, the femur broke again; this time he spent five weeks in bed and then got up with a splint and crutches. There was little pain with either fracture. Went back to business four months after first fracture, after some time on two, and then on one cane; has had no trouble with leg since. In September, 1910, after playing golf, the right knee began to swell, and has grown rapidly worse. The knee is very weak, but not painful. This patient had never had any trouble with walking before his fracture, and considered himself well. He had had shooting pains in body and limbs for 15 years. In August, 1910, he fell down a flight of stairs, rolling over and over, but is not aware of any injury. Examination shows Argyle-Robertson pupils, absent knee jerk, slight Romberg. No ataxia of gait or of arms. There is marked out-knee with considerable lateral motion, which has come on within a few weeks. Right knee $3\frac{1}{2}$ inches larger than left and fluctuates. Hard swelling upper end of left femur. Radiograms show an enormous callus 8 inches long, upper end of left femur, with indications of two united fractures, one two inches and one five inches below the neck; also indications of injury to right internal tuberosity of tibia. A caliper splint to fix the right knee and give lateral support was followed by subsidence of the swelling and rapid improve-

ment, and in a few weeks the patient went back to business, which he has been able to attend to since. There is still no ataxia in gait, and the knee is in good condition.

Case V. *Spontaneous fracture left femur. Right Charcot knee. Tabes.*

Man, 29, March, 1911. While lifting a piece of lumber five years ago, fractured shaft of left femur below lesser trochanter, was in bed in hospital three months, then on crutches several months; after that walked well and was able to work. Patient is a small man, but used to hard work, and considered himself well before and after his fracture, until he hurt right knee by a fall down stairs, January, 1911. A month later knee swelled to large size and patient became feverish and ill. There had been little pain. Examination shows very sick man, temperature 103.8. Slight Romberg, knee reflex gone, pupils perhaps a little sluggish; no ataxia



CASE V.—Spontaneous fracture left femur five years before; union with large callus.

in gait. Right knee very large and fluctuating. Patient was admitted to Post-Graduate Hospital, knee tapped, several ounces of pus removed, and injected twice with 8 c.c. two per cent. formalin in glycerine. The temperature gradually subsided and patient was allowed up in a Thomas caliper fixation splint after six weeks. After wearing this a few months the swelling subsided, and he was able to go back to light work. The radiograms showed an old fracture below the left lesser trochanter united with a very large callus.

Case VI. *Spontaneous fracture right femur. Tabes.*

Man, 38, March, 1911. Broke right femur about middle in January while pulling off his boot; there was little pain; was well and active, but had had paralysis right rectus oculi seven years before, and pains down legs last few years. Had had some difficulty in walking in the dark; ordinary walking had not changed. Examination showed knee reflex absent; pupils small and not responsive to light; free motion at point of fracture and considerable shortening. Skiagram shows a double oblique fracture with a free fragment displaced backward. After wearing an immobilizing splint two months union was solid, with large callus, and patient could walk with a cane.

Case VII. *Spontaneous fracture of right astragalus. Charcot astragalo-scaploid joint. Tabes.*

Man, 30, February, 1912. No history of in-

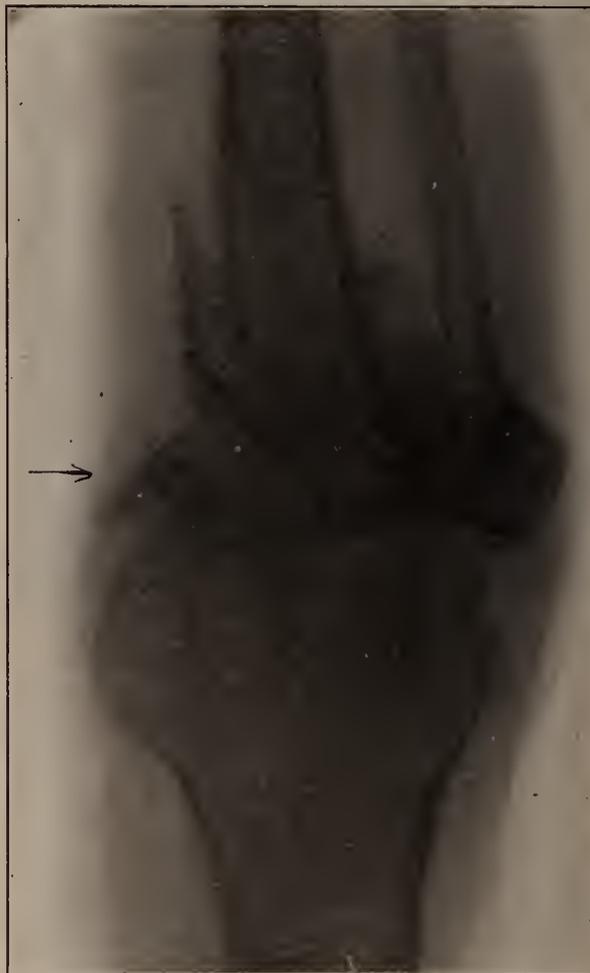


CASE VII.—Spontaneous fracture neck of astragalus with loose fragment.

jury; fluctuating swelling below and in front of right internal malleolus; no tenderness; pain in walking only; above symptoms about eight months. Examination shows absent knee jerks, contracted, unequal and sluggish pupils; Romberg's sign; no ataxia of arms or gait. Skiagram shows a fracture of neck of astragalus. Patient does not know when this occurred. This patient escaped from observation and the result is not known.

Case VIII. *Tabes. Fracture left humerus. Spontaneous fracture left tibial tuberosities.*

Man, 46, May, 1912. Excellent health until past few years. Has had pains in legs for about ten years and some difficulty in walking for four years. Slipped on icy pavement two years ago and fell heavily on left hand; there was but little pain. Examination showed a fracture of the anatomical neck of the left humerus, which united after five weeks in a splint. One year ago, Argyle-Robertson pupils, ataxia, and absent knee reflexes were noted. In December, 1911, after a long walk, his left knee suddenly bent under him, and the leg became useless, but he



CASE VIII.—Spontaneous multiple fracture of tibial tuberosities five months old; union without knee and free fragment at arrow.

did not fall. His entire leg became swollen and there was considerable discoloration, but he had no idea the leg was broken, as there was little pain. Patient was taken to a hospital where a skiagram showed oblique fractures of both internal and external tuberosity of the tibia. The internal tuberosity was split into two fragments. Examination in May, 1912, showed the fractures united, except a fragment of bone from the in-

ternal tuberosity, which was movable. The knee was somewhat enlarged and there was a moderate out-knee, but there was good motion at the knee. The patient was still using crutches.

Case IX. *Tabes. Spontaneous fracture of right femur.*

Man, 42, May, 1912. This patient has had difficulty in walking, especially in the dark, for more than ten years; he has also had absent knee jerks, Romberg's sign, Argyle-Robertson pupils and an ataxic gait for ten years or more.

In January, 1912, while seated and going through physical exercises, he drew his right leg up over the left, and felt something snap in the right thigh; he felt no pain. Examination showed complete separation at the middle and lower third, crepitus and false joint of motion. He was taken to a hospital and put up in a plaster splint. In May there was solid union with a very large callus and some shortening. The skiagram showed a double oblique fracture with a separate posterior fragment.

Case X. *Lues. Spontaneous fracture of femur.*

Man, 42, September, 1911. Lues eighteen years before, for which he received prolonged treatment. Thirteen years before he had had a gumma on the back of the head and a few months later a sore on the left arm above the elbow. In June, he placed the left leg over the right knee to untie his shoe, and the left femur snapped obliquely at the lower third. The fracture was preceded by pains in the left leg for two weeks. The leg was put in a plaster of paris splint, but after a month there was no attempt at union, and the bones were wired. When seen by the writer in September there was extensive infection and no union. In spite of free drainage, and subsequent amputation, the patient died from sepsis a month later. This patient had normal pupils and reflexes, and there never were any signs of tabes.

The material here studied consists of ten cases, including one of lues without tabes, all men; the ages at the time of observation ranged from 29 to 50. In the nine tabetic cases there were 10 spontaneous and one ordinary traumatic fracture, occurring from the age of 24 to 49. This does not include probable fractures of the internal tuberosity of the tibia in cases I. and IV. Six fractures were of the shaft of the femur; two (probably four) were of the condyles of the tibia; one of the patella; and one of the astragalus. There was, besides, a fracture of the anatomical neck of the humerus from a bad fall on the hand in case VIII. All these cases had most of the classic symptoms of tabes dorsalis at the time of examination, except that the ataxic gait was absent in all but cases III., VIII. and IX. In case III. there was no difficulty in walking at the time of the fracture, nor for five years afterward. In all, the fractures were painless, or nearly so.

In two cases (V. and VII.), the fracture as nearly as could be ascertained, was the initial symptom. In cases I., II. and IV. the fracture had been preceded only by sharp pains in the body and limbs, and in case III. by pains and ophthalmoplegia. In case VI., the fracture was preceded by pains, ophthalmoplegia and absent knee jerks. Nearly all the fractures united slowly, but firmly, with a very large callus, under rest and splinting. Case VII. escaped from observation, so that the result is not known. In case I., there was no large callus, but myositis ossificans of the rectus cruris following the fracture, and in case VIII. a small fragment from the internal tuberosity remained loose at the last observation, five months after the fracture.

From the study of the foregoing material it seems clear that

1. Spontaneous fractures are not infrequently an initial or early symptom of tabes.
2. Such fractures occur frequently before there is any disturbance of gait.
3. All adults who have had painless or spontaneous fractures should be examined for tabes.
4. Tabetics should avoid sudden or jerky movements, especially heavy lifting, and twisting movements.
5. Charcot joints may also be an initial or early symptom of tabes.
6. Persistent attacks of shooting pains in the trunk or limbs should always lead to an examination for tabes.
7. The term tabes dorsalis should be preferred to the misleading "locomotor ataxia," since an ataxic gait is not infrequently one of the latest symptoms to appear.

A CONTRIBUTION TO THE SYMPTOMATOLOGY OF CEREBRAL ABSCESS WITH SPECIAL REFERENCE TO DIAGNOSIS AND INDICATIONS FOR SURGICAL INTERVENTION.*

REPORT OF TWO CASES IN WHICH OPERATION WAS FOLLOWED BY RECOVERY.

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DESPITE the fact that the last decade has furnished an exceptional number of valuable publications on the diagnosis and treatment of cerebral abscess, we still stand sadly in need of additional diagnostic data before we can hope to fully materialize the unquestioned efficiency of surgical intervention in this particularly fatal affection. While there is perhaps no focal disease of the brain which offers, when opportunely diagnosticated, greater probabilities of surgical success, there is none which yields a more elusive and unreliable symptomatology. The diagnosis of cerebral abscess, therefore, is

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always attended with considerable uncertainty.

It is well known that cerebral abscess occasionally pursues a very chronic course without giving rise to any symptoms whatever, or else to such indefinite manifestations (hebetude, ill-defined psychic alterations, etc.), that its clinical recognition remains utterly impossible. Its existence is discovered with surprise at the autopsy. This is particularly apt to be the case when we have to do with abscesses situated in the so-called silent areas of the brain. It is encouraging to note, incidentally, that these silent areas are becoming more and more responsive, as our knowledge of anatomy and physiology increases, and as our powers of clinical observation are trained to greater diligence and acuity. The recent upheaval in the aphasia doctrine, which followed the radical assertions of Marie, affords, in this connection, a striking example of the gigantic strides which overtake now and then the habitually sluggish pace of our progress. The fertilizing influence of this heated controversy upon our conceptions of the physiology of the temporo-sphenoidal lobe still remains to be duly appreciated; we are now entering the phase of reactive calm, and yet we already have registered a number of valuable and viable acquisitions. Such outbursts of rebellion against classic dogma are essentially wholesome, and even should Marie's contentions be ultimately regarded as fundamentally erroneous—a fact which still remains to be proved medical science shall have become deeply indebted to this eminent clinician for the inestimable services he has rendered.

A circumstance which has materially impeded our progress in cranial surgery is to be found in the fact that the very seat of predilection of otitic abscesses is one or the other of the so-called silent areas (temporal lobe, cerebellar hemisphere), and that such abscesses constitute more than one-half of all cases. This annoying feature is less disquieting, however, in the hands of competent and experienced otologists to whom the close relationship is a matter of intimate knowledge. The more or less sudden appearance of severe cerebral disorder in a subject previously suffering from otitis media awakens suspicion at once.

A somewhat analogous view may be taken of abscesses resulting from traumatism about the head. The symptoms develop either shortly after the accident or only some considerable time afterward, but a distinct history is usually obtainable and sometimes a scar is visible, the seat of intracerebral focal disease generally corresponds approximately to that of the injury, and the symptoms, in the great majority of cases, are fairly characteristic. Both the diagnosis and the indication for operation are usually plainly evident.

It is all otherwise when cerebral abscess develops in individuals who give no history of traumatism or of pre-existing otorrhea, and in whom the most careful inquiry into antecedents

as well as the repeated and rigid physical exploration fail to reveal the slightest clue as to the probable nature of the affection. Hence, the necessity of availing ourselves of all possible sources of information and of correctly interpreting symptoms when they arise.

The general symptoms of cerebral abscess, such as headache, vertigo, vomiting, mental changes, etc., whether associated with fever or not, are in themselves of little diagnostic significance, inasmuch as they also occur in meningitis, tumor and many other affections of the brain.

The local symptoms of functional disorder which occur in cerebral abscess will naturally vary with the seat of the lesion. Of the greatest importance in ensuring well-directed attempts at surgical relief, they afford in themselves little if any evidence of the nature of the lesion. It is only when taken in conjunction with other factors, such as above described, that they acquire significance in this direction. Focal symptoms indicate focal disease and their clinical features are practically identical whether we have to do with a vascular lesion, a purulent focus or a neoplasm. There is, however, in my opinion, one exception to this rule, and that is the hemiplegia, which appears in the course of cerebral abscess. I believe that this hemiplegia exhibits a mode of development which is peculiar to it, and to it alone. I refer to the progressive hemiplegia which is mentioned in connection with the symptomatology of cerebral abscess in a number of text-books, but the description of which is either inadequate, or, more frequently still, wanting entirely. The symptom is not new, but I am convinced that it has been grossly neglected and that its diagnostic significance is ignored by many. The peculiar features of this hemiplegia were first emphasized, as far as I know, by Hirt. A comprehensive description of the symptom is to be found in the work of Oppenheim and in the article on encephalitis by Brissand et Souques in the *Traité de Médecine* of Charcot, Bouchard et Brissaud. In this country, the only available reference of value which can be furnished regarding the hemiplegia of cerebral abscess is the article by E. E. Southard in Osler's *Modern Medicine* (Vol. VII.). This author, whom I take pleasure in quoting, describes the condition in the following terms: "Paralytic symptoms tend to be monoplegic, and if hemiplegia eventuates the parts are successively and not simultaneously involved." The full characters of this hemiplegia and the peculiar mode of its development will become evident from the study of the two cases which follow.

CASE I. Miss B. M., age 22 housekeeper at home of her parents. Admitted to the Albany City Hospital, July 31, 1911.

Past history entirely negative as far as could be ascertained. Patient is said to have been perfectly healthy up to the time of present illness, although close questioning revealed the fact that she had had considerable headache for some

little time previous to the onset of the more serious manifestations which led to her admission to the hospital.

History of present illness. It was in the afternoon of the preceding Tuesday, July 25th, that the first alarming symptom appeared. The patient stated that while she was busy doing housework she gradually lost the use of her right arm; the weakness being first noticed in the hand, but later involving more or less the entire extremity. The following Friday, July 28th, three days later, the same disability gradually developed in the right leg. At the same time, stomach disturbances appeared, so that the patient had several severe vomiting spells. She also stated that she felt feverish and sick all over.

Physical examination shortly after admission revealed the following condition: Complete motor paralysis of both arm and leg on the right side. The upper extremity was markedly atonic; the lower, faintly rigid. The tongue was slightly deviated toward the right, but there was not the least trace of a right-sided facial palsy. All the tendon reflexes were elicited without difficulty, but were distinctly weaker on the affected side. A typical Babinski phenomenon existed on the right side and contrasted singularly with the abnormally lively plantar flexion observed on the left. The pupils were equal and yielded normal responses to light and to accommodation efforts. The organic reflexes were undisturbed. Examination of the sensory functions failed to demonstrate the existence of any definite disorders, save perhaps a slight degree of impairment of muscle-sense in the right hand and foot. The patient looked dull and fatigued; her countenance bore the unmistakable signature of serious illness. Although the patient understood perfectly all that was said to her and executed orders accurately, cerebration was sluggish; while words were correctly articulated, answers came slowly and mental effort was plainly visible. Her temperature taken at this time was 99.6 degrees. The pulse rate and arterial tension were practically normal.

I was unable to see the patient again until two days later (August 2nd). Upon returning to the hospital, I learned that in the course of the preceding evening and at various times during the night, the patient had had a series of severe convulsive seizures, one closely following the other, the condition at one time being practically that of status epilepticus. These convulsions invariably began in the right leg, then involved the right arm, and finally reached the musculature of the right side of the face. All of these attacks were strictly limited to the right side of the body; at no time were muscular twitchings observed on the left side. During the majority of the seizures consciousness was completely lost. Otherwise the condition of the patient had not changed materially. She complained very little of headache. The temperature had come down

to normal and the pulse rate remained at about 90.

The next day (August 3rd), the severity of the clinical picture had made a frightful headway. There had been no further convulsions of the entire right side with loss of consciousness, but muscular twitchings in the right arm and in the lower part of the face were observed at frequent intervals and lasted several minutes. At the time of my visit, there was almost constant twitching at the right angle of the mouth. A right-sided facial palsy was now very noticeable and, to our great astonishment, the patient had developed an absolute motor aphasia. There was not, however, the faintest trace of sensory aphasia. The young woman still executed orders correctly, but it was evident that the mental operations were rapidly submerging. She looked extremely dull and inert. The tendon reflexes on the paralyzed side were now distinctly livelier than on the healthy side. The pupils were dilated, but equal, and responded rather feebly to light. Ophthalmoscopic examination disclosed a very pronounced degree of choked disc on either side. The temperature had become subnormal and reached as low as 96.4 degrees on two occasions. The pulse rate oscillated between 80 and 60, and once slowed down to 50. Repeated urinalyses and blood examinations showed no definite changes. The leucocyte count never exceeded 6,600. Unfortunately a careful differential count was not made.

In the presence of such alarming developments one conclusion was inevitable, and that was the necessity of immediate surgical intervention. This was urged at once, but unfortunately before the full consent of the patient's family enabled us to proceed, twenty-four hours had elapsed. During this interval of delay, the young woman's condition grew steadily worse, the increasing dullness deepened into a stupor until well-defined coma supervened. The temperature remained subnormal until a few hours prior to operation, when it rose to 100 degrees, the pulse became weak and rapid, the almost constant twitching at the right angle of the mouth persisted and, finally, a beginning divergent strabismus became manifest.

Such was the discouraging aspect of affairs when, on the morning of August 5th, a desperate attempt to save the patient's life was entrusted to Dr. Edgar A. Vander Veer, attending surgeon to the Albany City Hospital.

My initial diagnosis, and that which I continued to favor throughout, was cerebral tumor, although the alternate possibility of cerebral abscess was expressed. While my friends had the courtesy of reminding me of the fact afterwards, I frankly admit that the probability of abscess never appealed to me.

Operation. After careful preliminary markings and the usual aseptic precautions, the pericranium was incised and the trephine first applied at a point corresponding to the middle segment

of the ascending parietal convolution of the left cerebral hemisphere. The brain was uncovered over an area approximating two and a half to three inches in all diameters. The aperture in the skull was later slightly enlarged downward to facilitate drainage. As the dura was incised, a well-defined area of circumscribed leptomenigitis came into view; the meninges were decidedly opaque, and yellowish streaks of exudate were plainly visible along the blood vessels. Exploration of the subcortical matter by means of a fine trochar soon led into an abscess-cavity of considerable size. Fully two ounces of a very foul smelling pus were evacuated right then and there. The opening into the cavity was enlarged sufficiently to ensure proper drainage and a soft rubber catheter left in situ. After having apposed at two or three points the edges of the external wound and carefully dressed the head, the patient was returned to the ward. Direct examination of the pus and of the growth on culture-media at the Bender Laboratory showed that the micro-organism concerned was the staphylococcus pyogenes albus.

Subsequent history. For almost forty-eight hours the outlook was far from brilliant. The temperature ranged from 101 degrees to 102.4, the pulse from 120 to 150, the stupor remained practically unchanged, the facial twitching continued. From this time on, however, consciousness gradually returned, the temperature came down very slowly to the normal point, the pulse resumed its normal characters, the strabismus and labial spasm disappeared. The first manifestation of reappearing cerebration was the patient's ability to say "yes" and "water" the third day after operation. Naturally, this was hailed with enthusiasm, even though no further additions to the vocabulary appeared for fully a week. After that the patient gradually learned to say other things, and by August 28th, about three weeks after operation, she was quite able to express many of her wishes. The return of motor speech since then, however, has been extremely slow up until very recently. For a long time spontaneous speech remained far in advance of that revealed by clinical examination. There were many words which the patient could not find, many which she articulated imperfectly, but she never used the wrong word, and if we used it for her, she at once interposed her objection. Her speech difficulty, however, remained strictly within the limits of motor aphasia; she always appeared to fully comprehend all that was said to her and around her, and has at no time exhibited the least trace of sensory aphasia.

The first return of motor power was noticed August 15th, ten days after operation, when the patient began to exhibit a certain degree of flexion and extension both at the hip and at the knee. The movements of the right lower extremity gradually became stronger and ten days later, August 25th, slight flexion of the fingers and forearm was observed. This improvement grad-

ually increased, but very slowly. The wound discharged abundantly for several days and the dressings were so rapidly saturated with offensive sero-purulent material that very frequent changes were indispensable. Drainage was carefully maintained for several weeks and the patient was discharged October 22nd, remarkably improved, but certainly not restored to her former functional integrity.

Actual condition. Upon leaving the hospital, the patient returned to her home in the country, and despite my repeated requests to have her brought back for observation, nothing was heard of her until I resolved to ferret her out myself, which I did a few days ago. It was then learned from the mother that the young woman had had three convulsive seizures since she had left the hospital. The attacks appeared at intervals of two months, but while the first two had been quite severe, the last one was very slight. Otherwise, the patient shows decided further improvement. Although a mowing gait is still evident, the right leg is stronger and is moved in all directions with greater facility. The right arm is carried well above the head, motion at the elbow is practically perfect, but there still remains an appreciable degree of wrist drop. While the fingers can be flexed strongly, the more delicate movements of the hand and fingers have not been regained, and writing is consequently impossible. Of all the evidences of recovered function, motor speech offers the most striking. The patient is quite able to carry on ordinary conversation and only occasionally fails to produce the desired word. She has also practically regained whatever reading ability she formerly possessed.

CASE II. G. B., a little girl of five and a half years, referred to me from a neighboring city, December 14, 1911, by her attending physician and admitted the same day to the Albany Hospital.

The past history presented nothing of immediate interest with the exception of the fact that there had been at various times a free discharge from both ears, but particularly from the left one.

The actual illness began, according to the mother's statement, November 29, 1911, with persistent and somewhat propulsive vomiting, headache localized especially over the left frontal region, fever and severe left-sided earache. Under the influence of absolute rest in bed, restricted diet, and gastro-intestinal antisepsis, the child's condition rapidly improved sufficiently to enable her to be up and about for a couple of days. This false recovery did not last long, however, and on Saturday, December 9th, ten days later, another febrile attack appeared and the severe headache and vomiting returned. It was at this time that the mother first noticed that the child did not use the right hand, though she still preserved the power of moving the upper extremity both at the elbow and at the shoulder.

The following day, December 10th, it was discovered that the child had lost entirely the power of speech. She had spoken very little since the onset of her illness; now she was totally unable to say anything. She would try now and then to articulate, but the word failed to appear. This condition of affairs continued, the disability of the right upper extremity gradually increased in severity and extent, when, on December 13th, four days after the onset of the brachial monoplegia, it became apparent that the child did not move the right leg. The mother also stated that she had observed, during the two or three days which preceded the patient's entrance into the hospital, occasional twitching in the muscles of the chin and in those of the right arm and leg. These spasmodic manifestations had never appeared on the left side of the body.

Physical examination shortly after admission disclosed the following clinical picture. Practically complete motor paralysis of both the upper and the lower extremity on the right side. The arm as a whole was decidedly atonic, and when lifted away from the bed, it fell back as an inert mass the moment the supporting hand was withdrawn. Some residual motility existed, however, at the shoulder joint. The leg likewise was almost entirely disabled, but, unlike the arm, exhibited spastic rather than flaccid features. I may note, in passing, that this difference in muscle-tone between the two extremities was also very definite in Case I. The analogy, in this respect, between the two cases seemed very suggestive to me. There was no deviation of the tongue nor any trace of facial palsy as far as could be ascertained by direct elicitation of volitional efforts. Toward the close of our examination, however, the child being evidently annoyed and bored by the prolonged manipulations, gave in to her feelings, and during the crying spell which followed it was noticed that the lower musculature of the right face was only imperfectly contracted and that the angle of the mouth drooped perceptibly. The radial and tricipital jerks were distinctly livelier on the right side than on the left. The same may be said of the ankle jerk. The knee jerk, on the contrary, was appreciably weaker on the right side than on the left. There was no ankle-clonus and only a doubtful Babinski reflex. The pupils were somewhat dilated, but equal, and yielded perfectly normal responses. No disorders of superficial or deep sensibility could be detected. With the exception of the little emotional outburst already referred to, the child's countenance remained placid and undisturbed throughout. In submitting to our examination, she exhibited, for a child of her years, almost unnatural pliability, so much so, indeed, that I was led to inquire at once into the normal characteristics of her temperament. I soon learned from the mother that my little patient's actual mood was a complete reversal of her habitual disposition. The child's facial expression indicated indolence and disori-

entation rather than mental dullness. While nothing escaped her, she looked on apparently with complete indifference. Although not a word could be articulated, the little girl plainly showed that the sensory centres of speech were intact by correctly executing orders, and by nodding in the affirmative or negative in response to our persistent efforts at direct questioning. The child gave no indication of suffering from headache or from pain anywhere.

Careful examination of the eye-grounds showed no definite alteration. Urinalysis entirely negative. Examination of the blood revealed a definite leucocytosis. Although I have been unable to find this recorded in the history-chart, I recollect distinctly that the leucocyte count was approximately 15,000. The temperature at this time was 100 degrees, the pulse rate 100 to 110.

While I was examining the child and reflecting upon the history obtained from the mother as to the manner in which this whole condition had appeared, all the features of my other patient's case promptly recurred to my mind. The successive developments were so closely analogous in both cases, the clinical findings so nearly identical, that there seemed to me to be little doubt that here again the underlying condition must, almost necessarily, be cerebral abscess. I at once imparted my views to the mother and urged speedy intervention. I expected a request for delay, but obtained unhesitating and unre-served consent. The necessary preparations were made that same evening and the child was operated upon the following morning, December 15th, by Dr. Edgar A. Vander Veer. During the night, a very appreciable degree of mental dullness developed and repeated muscular twitchings were observed on the right side of the face and in the fingers of the right hand.

Operation. The left cerebral hemisphere was here again exposed over the middle portion of the ascending parietal convolution. As the dura was incised there was no evident bulging, but the underlying surface of the brain presented typical lesions of circumscribed suppurative meningo-encephalitis. Over an area approximately the size of a silver dollar, and corresponding to the inferior segment of the ascending parietal convolution and to the anterior lobule of the supramarginal gyrus, the pia exhibited a milky opacity and delicate yellowish white streaks could be seen along the blood vessels. Above this main patch, a very definite zone of greyish-green discoloration about the size of a quarter occupied the actual cortical substance and yielded readily to the slightest pressure of the finger. In the immediate proximity of these lesions, the brain seemed distinctly oedematous. Exploration of the subcortical white matter failed to reveal the presence of an abscess-cavity. The wound was only partly closed and ample provision was made for free and prolonged drainage.

Subsequent history. The child rallied remarkably well from the operation, regained consciousness without vomiting, and, to the great astonishment of all, partly recovered her speech during the afternoon of the same day. Encouraging as this unquestionably was, other manifestations of less favorable omen likewise appeared. The temperature shot up to 102 degrees, the pulse rate jumped to 150 and 160, the child was seized with several severe attacks of Jacksonian epilepsy and the intervals between the attacks were punctuated by almost constant spasm of the right hand and wrist and by extreme restlessness. For two days I was tormented by the fear that we had spurred into wider activity a hitherto subacute and circumscribed meningo-encephalitis. During the following night the child had three Jacksonian seizures of exceptional severity. I saw them, and they were typical.

In the course of the next day, December 16th, the little patient had three more convulsions of the same type and of equal severity. Some return of voluntary motion was observed at the knee; but the child spoke less willingly than on the previous day and articulated less clearly. The pulse rate had come down perceptibly and was now 120. The temperature likewise showed a distinct drop and toward evening was less than 100 degrees.

On the third day after operation, December 17th, the child had two severe Jacksonian seizures, but nevertheless looked better generally, and her temperature curve almost reached the normal point at noon. The following day, December 18th, there was no convulsion until late in the evening, an interval of 26 hours having elapsed since the preceding one. Although fully as severe as the others, this convulsion fortunately was the last. From this time on we had no further cause for apprehension and the little patient's condition improved rapidly.

The motor power previously noted in the lower extremity steadily increased and by the sixth day after operation, December 20th, the child exhibited slight motion at the elbow joint. The temperature had become normal and practically remained so thereafter. The pulse rate varied from 100 to 110. Although our little girl would not favor any of her medical attendants with actual proof of her regained faculty of speech, she spoke freely with her mother and with the nurse in charge. She seemed able to say practically all that she wanted and articulation was perfect. The very next day, December 21st, the child could move the lower extremity in practically all directions and had recovered sufficient motion in the upper extremity to swing it forward and upward in an attempt to shake hands with me. While voluntary motion had evidently returned in great part at both the shoulder and the elbow, the wrist was still markedly atonic and motor strength in the musculature of the hand and fingers was practically *nil*. The movements of the entire extremity, moreover, were

distinctly ataxic. The little patient was in better mood on this occasion and for the first time consented to answer my questions directly. I could detect no trace of dysarthria, but occasionally a word would not come. A further gain was appreciable two days later, December 23rd, when on shaking hands with the child, I noticed that she was quite able to exert distinct pressure with the fingers. Movement at the wrist was now possible, though still weak, and the arm as a whole was less ataxic than before. After this time, the residual defects cleared up rapidly and by December 30th, two weeks after operation, the child had regained almost entirely the use of both the arm and leg. The various movements were executed without any difficulty, the grasp of the right hand was practically equal in strength to that of the left, there was hardly a trace of ataxia in the arm, and the child was perfectly able to feed herself. During the first few days after operation, there had been considerable oozing from the wound, but subsequently it subsided rapidly and at this time the dressings were barely tinged. Drainage was thereafter discontinued.

The child was kept under observation at the hospital for three weeks more, to ensure adequate after-care of the wound, as well as to guard against any possible secondary developments of an unfavorable nature. She spent most of her time investigating the various wards of the hospital and making numerous friends, and in discussing the relative merits of her toys and those of other patients of her years. I examined the child repeatedly during this time, and the day previous to her discharge from the hospital, January 21, 1912, she was submitted to a very complete program of physical and mental tests. I was quite unable to detect any evidence of residual defect. She was seen again only a short time ago and her condition was found to have remained perfectly satisfactory.

Thus, as a symptom common to both the cases reported, we have a hemiplegia exhibiting a mode of development which is so distinctive that it possesses, I believe, almost specific diagnostic significance. In the first case, I utterly failed to correctly interpret this progressive hemiplegia because an adequate description of it is totally wanting in text-books. The term progressive hemiplegia is closely identified with the symptomatology either of cerebral thrombosis or of cerebral tumor. These classic notions have gained such firm foothold that they continue to guide our reasoning for a long time, and if we ultimately abandon them, it is almost with regret. Knowing as I do that many gliomata produce no definite disorders until hemorrhages occur within them, it was perfectly simple to suppose that the sudden appearance of a right brachial monoplegia was due to a hemorrhage within the supposed neoplasm, and that the associated monoplegia which subsequently developed was due either to pressure-oedema or to further

hemorrhage. Into this error I was greatly assisted by the negative blood findings, by the comparative absence of fever, and by the presence of well-marked choked disc, which certainly represents a rather uncommon manifestation of abscess.

The clinical evolution of the hemiplegia of cerebral abscess now appeared to me to be so well characterized that I was determined henceforth not to let it pass unrecognized. When I was first asked to see Case II., I had my misgivings regarding the probable nature of the affection and they were confirmed without delay. The child was seen in the evening of the same day and was operated upon the very next morning. With the typical history already detailed regarding the development of the motor paralysis, the decided febrile reaction, the well-marked leucocytosis and the additional information of previously existing otorrhea, I felt convinced that we had to do with an abscess of the brain. An abscess, in the strict sense of the word, did not exist; this error, however, I do not regard as being, properly speaking, an error. We found a very definite patch of meningo-encephalitis which, after all, simply represents the first stage of abscess formation. Had we waited for further symptoms to accentuate the necessity of intervention, we would undoubtedly have been enabled to actually demonstrate an abscess, but I fear that today I would have the chagrin of describing a residual palsy and perhaps also a speech defect, instead of presenting a little patient who has integrally recovered her functional activities.

To return to the significance of progressive hemiplegia in diagnosis, it is evident that there is no necessity of rejecting the term, and that it remains applicable to the symptomatology of cerebral tumor and vascular lesions as well as to that of cerebral abscess. It is equally plain, however, that in arriving at a differential diagnosis between these several conditions, we cannot use the term progressive hemiplegia indifferently and without qualifying it additionally; it becomes absolutely indispensable that we correctly estimate the degree of this progressiveness. While it is true that in cerebral thrombosis, a hemiplegia may appear very gradually, one limb becoming disabled after the other, so that it may even take several hours for the hemiplegia to mature, the clinical picture of the symptom is complete in less than twenty-four hours in the great majority of cases. It has been said that cerebral hemorrhage may occasionally exhibit practically the same features. This I am unwilling to believe. In cerebral tumor, the paralytic symptom which appears first as a monoplegia remains stationary for a long time, then an associated monoplegia slowly develops, and if a complete hemiplegia is to supervene, it usually requires a period of weeks and even months before it becomes manifest. Thus, in point of chronologic evolution, the hemiplegia of cere-

bral abscess is intermediate to that of cerebral thrombosis and that of cerebral tumor. It demands for its completion a period which usually varies from six to ten days, although it may take a longer time to develop, and in rare cases appear more rapidly. It may begin either in the face, or in the upper or lower extremity. From the face it spreads to the arm and then to the leg, and *vice versa*; when it first appears in the arm, it involves next either the face or the leg. In the majority of cases reported during the last few years, the initial paralysis has first appeared in the arm and then extended to the leg, the face being involved much later and to a lesser extent. I cannot be led into the belief that this type of hemiplegia can develop under circumstances other than those which govern and accompany the formation of a focalized encephalitic lesion. This form of hemiplegia, I repeat, is no new symptom, nor was it meant to present it as such, but I do know that a comprehensive knowledge of this symptom is not obtainable from text-books and that its clinical significance is widely ignored. There are a considerable number of cases on record in which this hemiplegia is typically described; in some of them, other symptoms clearly pointed to abscess of the brain, operative treatment was resorted to and was followed by recovery in the majority of instances. In other cases, some emanating from sources too reputable to divulge, no attempt at surgical relief was made, but valuable contributions to our knowledge of the pathogeny and pathologic histology of cerebral abscess undoubtedly resulted. It is difficult to understand why some of these patients were not given the benefit of surgical intervention, if it be not the very fact that the hemiplegia of cerebral abscess is insufficiently understood.

Of course, a hemiplegia is not a constant manifestation of abscess of the brain, although it is certainly more common than is generally supposed. My feeling in the matter is that when it does present, it should be recognized without delay in view of its important bearing on successful intervention. In relatively typical cases of cerebral abscess, other manifestations such as febrile disturbances, blood changes, disorders of the sensory speech centres, the cerebellar syndrome, etc., will quite suffice to render the diagnosis apparent, particularly when a co-existing history of previous injury or otitis media obtains. Under those circumstances, hemiplegia or no hemiplegia, its presence is not indispensable to a correct diagnosis. It is in the atypical cases of cerebral abscess that the chief difficulties arise, in cases of gradually increasing cerebral disorder of obscure nature, in which repeated questioning fails to show that the condition developed as the result of head injury or of pre-existing aural affection, and where the most scrupulous physical examination itself yields but negative findings. Under these conditions, the subsequent appearance of the type of hemiplegia

just described practically suffices, I believe, to ensure diagnosis. It should further be stated that it is exactly in this category of cases that the hemiplegic syndrome most frequently develops. It must not be forgotten, in this connection, that cerebellar lesions, and, among them, cerebellar abscess, may determine a more or less well-defined hemiplegia. This hemiplegia may be either homolateral or heterolateral. When homolateral, the condition is one of atony and ataxia rather than one of actual motor weakness and the tendon reflexes may be either hypoactive or, more rarely, apparently wanting entirely. When it is a heterolateral hemiplegia which presents, it is due to compression of the pyramidal tract either in the pons or medulla, the paralysis is distinctly spastic in type and associated with exaggerated reflex activity. Moreover, whichever type of hemiplegia appears, this hemiplegia will not be constituted by the intervallary superposition of one monoplegia upon the other as is the case with the form of hemiplegia described above. There may be progressiveness in intensity but not in distribution; the unilateral atony or rigidity will usually involve the various segments evenly from the very outset. Finally, a cerebellar lesion which is of sufficient size to determine either a homolateral or a heterolateral hemiplegia will, in the majority of cases, have given rise likewise to cerebellar ataxia, nystagmus and other symptoms of cerebellar disease. For all these reasons, it would seem unlikely that real difficulty could arise in distinguishing the hemiplegia of cerebral abscess from the hemiplegia of cerebellar abscess.

As regards the differential diagnosis of cerebral abscess associated with hemiplegia from other conditions producing a unilateral paralysis, it has already been sufficiently shown that, in point of time required for its development, this hemiplegia itself differs materially from that of either cerebral thrombosis or cerebral tumor. The other points of differentiation between the three conditions cannot well be considered here without unduly augmenting the scope of our subject.

To attempt a differential diagnosis between cerebral abscess and circumscribed suppurative meningo-encephalitis appears to me not only superfluous but illogic, to say the least. It hardly seems necessary, indeed, or even practical, to establish a distinction between two conditions which do not represent two different lesions, but in reality two different stages of one and the same lesion. Cerebral abscess may justly be regarded as a circumscribed suppurative encephalitis, or meningo-encephalitis, which has reached maturity. While the diagnosis between the two may be made in some text-books, its clinical realization is quite impossible.

The symptoms upon which greatest reliance can be placed in reaching an early diagnosis of cerebral abscess and the clinical developments which furnish the strongest indications for oper-

ative intervention may be jointly summarized in the following considerations.

Of general symptoms, the febrile reaction when present, the early appearance of psychic manifestations, persistent headache, frequently of a dull and constricting character, changes in the blood-picture, and the slowing of the pulse rate, are by far the most important. Insufficient in themselves to warrant surgical interference, they acquire considerable value in the presence of a previous history of traumatism or of otitis media; when associated with local symptoms, they complete the indications for operation.

The appearance of symptoms of focal cerebral disorder are of the very greatest importance both for topical diagnosis and for well-directed and intelligent operative procedure. It is only when taken in conjunction with the general symptoms mentioned above, however, that they clearly point to cerebral abscess. Here as elsewhere, the well known rule formulated by competent and experienced clinicians is to be applied. A diagnosis should never be made from one symptom alone, but from a careful survey of all the symptoms present, and particularly from the predominance of certain of them, as well as from the mode and rapidity of their development. It is in this respect that the hemiplegia which has furnished the essential motive of this communication assumes such great significance. This hemiplegia represents more than a symptom; it almost constitutes a syndrome. It may appear either early or very late in the course of the disease. When it occurs in the early stages, it indicates that the Rolandic area has probably been primarily involved and it is here that the symptom attains its maximum diagnostic value. It enables the surgeon to intervene during the stage of initial encephalitis, before the actual formation of an abscess-cavity and consequently before any very material damage has been done to the brain centres. Under such circumstances, the chances of obtaining remarkable restoration of function are appreciably increased. When the progressive hemiplegia is a late manifestation of cerebral abscess, it is due, evidently, to the secondary extension into the subcortex of the Rolandic area, of an already matured abscess originating from some adjacent region of the brain, as, for instance, from the frontal lobe, or the temporal lobe. The hemiplegia still retains its full significance, it still remains an imperative indication for intervention, but, of course, as considerable destruction has already occurred, complete retrocession of the paralytic disorders can hardly be expected.

The occurrence, at any time in life, of a hemiplegia which starts as a monoplegia and requires several days for its full development, especially if it be associated with either fever, persistent headache, hebetude or distinct blood changes, with any or all of them, supplies all the indications necessary for immediate surgical intervention.

The apoplectiform onset, in a young adult who is neither syphilitic, nor tubercular, nor alcoholic, of a localized paralysis associated with convulsive manifestations and accompanied by fever, strongly indicates cerebral abscess and justifies, in the great majority of instances, speedy operative measures.

The more or less sudden appearance of aphasic disorders or of a monoplegia in a subject previously suffering from otitis media, implies almost necessarily the existence of cerebral abscess and practically suffices to warrant surgical treatment.

There is only one treatment of value in abscess of the brain and that is surgical intervention. The earlier a diagnosis is reached and the more promptly operative measures are resorted to, the greater will be, naturally, the chances of obtaining favorable results. The careful statistics recently tabulated by Macewen, Oppenheim, Körner, Broca, Krause, Starr, and others, show that operation has been followed by recovery in more than fifty per cent. of the cases. While it is true that intervention upon the brain is a serious matter and that undue haste is never justifiable, hesitation and unnecessary delay are prone to be followed by disastrous results. In the presence of fairly well-defined general symptoms and of suggestive antecedents, the appearance of a focalizing symptom should be the signal for operative preparations. If it be the progressive hemiplegia described in this communication which constitutes the focal manifestation, one should not wait for this hemiplegia to mature or for coma to supervene. The moment a contiguous monoplegia becomes added to the initial monoplegia, the hour of intervention is at hand. In the great majority of instances, the findings will legitimate the course adopted. Possibly, a few unnecessary operations may be recorded, but it has only very rarely happened that a patient has died as the result of such intervention at the hands of a careful and competent surgeon. It does happen commonly enough that the lesion diagnosed is not to be found, and that a focus of an entirely different nature is discovered, or else that no focus whatever can be demonstrated. There are many such cases on record and some of them have been furnished by perfectly able and even distinguished observers. As a rule, these patients have fared very well and have recovered not only from the shock of the operation, but also from the serious manifestations which necessitated it. Some of the most glorious achievements in the annals of brain surgery belong under this heading.

If, on the one hand, it behooves that undue delay be avoided, it is equally important, on the other hand, that intervention be not abandoned because of the exceptional severity of the clinical picture. The presence of coma, or the apparent development of grave complications such as diffuse suppurative meningitis, sinus thrombosis, etc., does not contraindicate operative measures,

and it is well known that even under such discouraging circumstances remarkable results have not infrequently been obtained. Our first case is an excellent illustration of this fact.

While it is not intended to discuss the actual surgical features of the treatment of cerebral abscess, there are, from a neurologic standpoint, certain associated considerations which are of sufficient importance to be emphasized in this connection. The first and foremost prerequisite to rational and successful intervention upon the brain is the accurate preliminary determination on the skull of the point at which the supposed lesion is situated. This should be done in accordance with the rules of craniotopography formulated by Poirier, Kocher, Krause, Broca and others. Operation on the brain is too serious a matter to be undertaken in haphazard fashion, and it is nothing short of criminal to rest satisfied with only approximate markings as the starting point of interventions which already present sufficient difficulties when the markings have been carefully and repeatedly controlled.

After sufficient bone has been removed to permit adequate incision of the dura, the next step should be to ascertain the presence or absence of localized meningitis. If a cerebral abscess exists and that its localization has been accurately diagnosed, this meningitis will rarely be wanting; once found, it should constitute the chief guide both as to the direction in which it may be necessary to enlarge the incision, and as regards the subsequent exploration of the subcortical white matter. When a definite abscess-cavity has been located, it is indispensable that it be sufficiently incised to allow free evacuation of the contained pus. There is decided advantage when such an abscess-cavity occupies the Rolandic area, in practising this incision as far posteriorly as possible in order to minimize additional traumatism to the intracortical motor apparatus. Moreover, this precaution will likewise favor subsequent drainage, inasmuch as the patient will lie the greater part of the time in the dorsal decubitus. It is extremely important that ample drainage be assured and that it be maintained during a considerable period. Another point in the after-treatment of cerebral abscess which should be emphasized is the desirability of changing the dressings long before the conventional time, when the patient's general condition reveals unsatisfactory features, such as a return of mental torpor, a rise in temperature, etc. I have sometimes felt that the dressings were too tight or that drainage was imperfect, and usually the change in the dressings was followed by prompt amelioration.

Discussion.

DR. WILLIAM SEAMAN BAINBRIDGE, New York City: Dr. Archambault has so admirably covered the symptomatology, diagnosis and treatment of brain abscess of otitic origin that I shall not refer to this phase of the subject.

Brain surgery, as applied to abscesses, is not a new field. The opening and draining of brain abscesses was practised long before the era of modern brain surgery. Dupuytren and Detmold, almost a century ago, opened deep abscesses of the brain, and medical and surgical literature abound in instances of the surgical treatment of this condition. Of recent years, however, the field has become almost entirely preempted by the otologist on the one side and the "brain specialists" on the other. It is not difficult to understand why the otologist should be conspicuous in the treatment of brain abscess when it is recalled that two-fifths of these cases, if Church's figures are correct, follow purulent otitis media. The wonderful strides made within recent years in brain localization, and in the more careful observation and interpretation of symptoms referable to the brain, have increased the scope of the surgical work of the "brain specialist."

There is, nevertheless, a field still occupied by the general surgeon with reference to the diagnosis and treatment of cerebral abscesses, a field which emphasizes almost as much as any other the fact that the general surgeon must be thoroughly conversant with these conditions and be ready to cope with them when present.

According to Church, two-fifths of all cases of brain abscess are due to suppurative middle ear disease; one-fourth to head injuries, and 1.6 to general pyemic states. Septic inflammation of the nasal and pharyngeal spaces, brain tumors, etc., give rise to the remainder. Of 55 cases collected by Sajou, 28 occurred after injury, 24 after aural disease, and 3 after typhoid fever. The figures of Fort and Lehmann give an idea of the relative frequency of cerebral as compared with cerebellar or other abscesses of the brain; according to them, 227 out of 458 cases being cerebral, 113 cerebellar, and 11 involving both cerebrum and cerebellum, and 7 being confined to the remaining portions of the brain. Of 1,400 autopsies at the Royal Victoria Hospital, Montreal, in 11 cases cerebral abscesses were found. Of these, 6 were traceable to the middle ear, 2 were of tuberculous origin, 1 was metastatic in the course of septicemia, and 2 were so-called idiopathic. Some authorities hold that about one-half of all cases are of traumatic origin. Pitt believed that nearly one-half of all brain abscesses are secondary to local disease of the cranial bones. Cerebral abscesses come under the following category:

1. Acute traumatic of the cortex.
2. Chronic traumatic, the pus in these cases being deeply situated.
3. Otitic, associated with acute or chronic purulent otitis media.
4. From nasal or pharyngeal spaces.
5. Following osteitis, caries, or ulcerative processes in other portions of the skull.
6. Metastatic from the lungs, heart, liver, intestines, or other organs.

7. Idiopathic, in which careful autopsy examination fails to reveal the primary source of infection.

Of the various classes of cerebral abscess, those due to injury of one kind or another are the ones most frequently seen by the general surgeon, unless he be called in consultation by the otologist, the neurologist, or the general practitioner, in which event he may encounter any class of cases. He must be able, therefore, to deal with cerebral abscess resulting from any cause and situated in any part of the brain.

In this connection I wish to express the hope that some of the members of the section, who are especially interested in the nervous and mental aspects of the case, will speak of the possible influence of cerebral abscess upon criminology. It is a matter of record, I believe, that Oscar Wilde was found, upon autopsy, to be the victim of a large brain abscess of otitic origin, if I mistake not. In view of the accepted fact that certain classes of cerebral abscess, notably the encapsulated, chronic kind, may exist for months, and even years, without giving rise to symptoms which attract special attention, and that they may suddenly give rise to various symptoms, such as aphasia of one kind or another, criminal tendencies, and other changes in character, a question may arise as to the possible part which this abscess played in Wilde's career. The criminal records show cases of crime of a quite unexpected nature in which brain abscess was found when autopsy was performed upon the criminal. A case of this kind was recently called to my attention. A young dentist, engaged to be married to a beautiful and accomplished young woman, suddenly, and without warning, entered the room where his fiancée was playing the piano, shot and instantly killed her. He fled, but was overtaken and captured. In some manner he succeeded in ending his own life while being taken in a closed carriage back to the town where the crime had been committed. Autopsy revealed a large brain abscess. In the light of his previous exemplary life, it was supposed that this caused his sudden change of character and prompted him to commit the crime.

In other cases, several of which have come under my observation, patients dying from other causes have been found upon autopsy to have large brain abscesses, to which neither any obtainable history nor any manifest symptoms directed attention in life.

Such cases, with which alienists and criminologists are doubtless familiar, give rise to an interesting train of thought.

When once a reasonably probable diagnosis of brain abscess has been made, exploration is justifiable. The skull no longer contains within its confines a *terra incognita*, and exploratory craniotomy is now quite as justifiable, and many times quite as urgent, as is exploratory laparotomy.

The technic of the operation for cerebral abscess varies within certain limitations. The

technic which I employ is, in the main, that adopted by Krause. After trephining according to the usual technic, the opening of a brain abscess always requires division of the cerebral cortex. Exploratory puncture through the dura in suspected cases has been abandoned by many operators. As a rule the dural flap is fashioned with a dependent base, thus allowing ample space for inspection. The arachnoid is protected from contact with the infectious material by means of sterile iodoform gauze, or the less irritating gauze soaked in albolene, inserted between the dura and the arachnoid.

In case of abscess in the deeper white substance of the brain, the question of the localization of the pus focus is different. The brain is first punctured with the blunt end of a needle of wide diameter. If it is under pressure and is not too tenacious, the pus will ooze out through the needle. If no pus appears, suction may be made, the needle being at the same time slowly withdrawn. If this fails, incision with the knife is indicated, provided the clinical picture warrants belief in the necessity for evacuation of the pus in order to save life.

The abscess being located, the cannula is left in place and used as a guide. The knife is then carried along the needle, and the abscess-cavity opened to the extent which its size requires. If desired, closed forceps may be introduced into the cavity, directed by the needle, and opened when the cavity is reached. In the event of smaller accessory cavities, the dividing walls are broken down and one large cavity made. If the abscess be of acute septic origin, its walls should not be curetted, because of the danger of extending the infection. If the abscess be chronic and have a distinct membrane, this membrane should be removed. Drainage is provided for by means of sterile gauze or rubber tissue, or by a small crucial incision, low down, which is left open. The osteoplastic flap is then closed in the usual way.

PATHOLOGICAL ANATOMY OF GOITER.*

(A MACROSCOPIC AND MICROSCOPIC STUDY OF
FRESH MATERIAL FROM 2,500 CASES.)

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SPECULATION in science often leads to self-deception and has caused many excellent and conscientious observers to write fiction regarding scientific subjects. Such statements as the following are found in literature written by some of the best observers upon the subject of goiter: "In a majority of the cases of exophthalmic goiter occurring in non-goiterous regions, and, to a much less extent, in those oc-

curing in goiterous districts, the hyperplasia develops from normal gland base." Such a statement is not based upon proven facts but upon observations which have been unconsciously colored by speculation. No one can say positively that an exophthalmic goiter "develops from a normal gland base," because no one has ever seen an exophthalmic gland in the process of development. Other statements occur such as: "Tracing the development of hypertrophy and hyperplasia from the normal gland, the first change noticed is the increased blood supply." This statement may be true but it, too, is based upon speculation and not upon actual observation of a developing gland. Actual facts should not be mixed with unlabelled speculation.

An endeavor, therefore, to separate the known from the unknown, regarding the pathology of goiter, leads the writer to an extremely academic consideration of the subject based upon examinations of over 2,500 specimens, which were removed at operation. These specimens were examined macroscopically and microscopically immediately after their removal. They were, therefore, studied in a perfectly fresh condition without the artifacts coincident to fixation. It was noted that the specimens divide themselves into two groups namely: a group composed of symmetrical thyroids and a group of asymmetrical or nodular thyroids.

The symmetrical thyroids vary in size from that of a normal foetal thyroid to many times the normal. Upon gross examination of the cut surface of the symmetrical specimens two very definite pictures are noticed, namely meaty glands with acini which are not distended and hence not readily visible (Fig. I-F.), and glands consisting of large acini, which are filled with jelly-like colloid material (Fig. I-D.). These are, however, descriptions of the extreme conditions because many specimens though meaty also contain some colloid material (Fig. I-E.). The amount of colloid material found varies within rather wide limits.

The two conditions just described, bear no apparent relation to the size of the specimen.

Microscopic examination of these glands reveals varying pictures of the acini, or gland units. The extremes of these are small acini with epithelial hyperplasia without colloid (Fig. I-F.) and large acini with colloid and no epithelial hyperplasia (Fig. I-D.). Both epithelial hyperplasia and intra-acinar colloid are, however, often present in the same gland (Fig. I-E.). The size of the acini varies in all of these glands and even in the same gland, but the variation is not sufficiently great to destroy the thyroid shape. The specimens may be diagrammatically represented in the accompanying figures.

Fig. I contains all of the thyroid shaped thyroids. The first of these is the foetal thyroid (A), the glandular unit, or acinus, of which is a group of cells without a patent lumen (a).

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.

The "normal adult thyroid" (B) is composed of acini (b), which consist of low or flat cuboidal cells, with a small amount of protoplasm, surrounding a lumen, which is filled with a colloid substance. One also finds occasionally an adult thyroid (C) which contains, in addition to the colloid acini (b), many acini of the foetal type (a).

Where the "normal" thyroid ceases to be normal and begins to be pathologic is still undetermined. At autopsy many adult thyroids, in non-goiterous individuals, show evidence of abnormal changes such as the presence of dense connective tissue and lymphocytic infiltration.

There is, however, not infrequently seen, a thyroid (D), which is larger than the normal thyroid and consists of acini (d) similar to those found in the normal thyroid with the exception that they are larger and contain more colloid.

Other specimens (E) consist of acini which are lined with large cuboidal cells and which contain colloid material (e). The walls of these are often crenated to form intra-acinar papillary projections (e). (Acini of all of the above described types are found also in such a specimen. (?).)

The last type (F), of symmetrical specimens consists of acini (f), which contain little or no colloid material but the lumen of these is almost completely filled with the large hypertrophic or hyperplastic cells.

Many gradations occur between these types so that it is often difficult to say that a gland belongs to any one pure type. These are the main and only distinguishing characteristics which are seen in the thyroid.

The sequence of development of these, the anatomical and histological conditions or stages—if they are really stages of one condition—remains undemonstrated in the human thyroid. Marine has stated that the amount of colloid material increases as the hyperplasia decreases. This he has demonstrated experimentally upon dogs and fish, but the work has not been confirmed upon human material. His work adds experimental evidence to the chemical parallel which exists between the amount of colloid and the amount of iodine, a fact which was pointed out by Oswald.

The essential and dominating feature of the specimens, which have passed through the writer's hands, have thus been briefly described without recourse to the terminology, which one finds so profusely distributed in the literature, and which is largely a mixture of clinical symptoms or signs, authors' names and a certain amount of anatomical description.

The writer's belief that our knowledge of the thyroid is too limited for us to recognize all of the clinical pictures, which may be associated with its pathology, has made him refrain, at this stage of our knowledge, from making pathological diagnosis in his daily routine reports to the clinician.

The writer has recently been describing all of his specimens without reference to clinical pictures and the following descriptive, instead of diagnostic, terminology has gradually evolved itself:

The foetal thyroid (Fig. I-A.), which is not seen surgically; the "normal" adult thyroid, which contains some colloid (Fig. I-B.), but which is also not seen surgically; the adult thy-

These anatomico-pathological observations may (I-C.), a condition which is seen at autopsy and occasionally at operation in cases, which are explored for a possible thyroid hyperplasia; the hypertrophic thyroid with large colloid acini (Fig. I-D.), a condition which is seen in cases with suggestive clinical symptoms of hyperthyroidism similar to those found in the next group, which may be described as the hypertrophic thyroids with epithelial hypertrophy or hyperplasia without intra-acinar colloid (Fig. I-E.), a condition which is definitely associated with a certain symptom complex, which we call hyperthyroidism. This clinical condition is also often associated with a hypertrophic thyroid with epithelial hypertrophy and colloid (Fig. I-E.). These include all of the symmetrical or thyroid shaped thyroids, which are found normally and pathologically.

Since descriptions, rather than diagnoses of the pathology found at operation, have been sent to the clinician, the latter has shown more accuracy in correlating his findings with other conditions than the pathologic and clinical extremes.

All of the pathologic conditions of the gland, which come under the heading of goiter do not allow the gland to retain its original shape. Asymmetrical or nodular glands contain usually, if not always, one or more encapsulated oval or round adenomata (Fig. II-). These vary greatly in size and number. They may be millimeters or centimeters in diameter; they may be single or there may be so many present that the gland becomes a nodular mass (Fig. II-B.).

The capsule of the adenomata is fibrous connective tissue, which varies greatly in thickness and density. It is frequently calcareous. The body of the tumor upon gross section is variable. The cut surface of the simplest undegenerated tumor is firm, uniform and free from macroscopically visible colloid. The acini of such a tumor are foetal in type (Fig. I-a; Fig. II-a), although they may contain a very small lumen (Fig. II-c). The acini are more widely separated by a delicate inter-acinar stroma than in the foetal thyroid. Upon the cut surface one readily recognizes that one does not always find the simple adenomata which have just been described; colloid material is frequently seen in large amounts (Fig. II-B, b & d.); such acini are easily grossly visible. Upon microscopic examination the acini are found to be large, lined with flat cuboidal cells and filled with colloid (Fig. II-B). The colloid acini are indistinguishable from those found in

colloid thyroids (Fig. I-D.) described above. If one searches such a tumor, foetal acini are certainly to be found. Acini composed of hypertrophic cells are occasionally found (Fig. II-B.).

Red, brown, or old yellowish hæmorrhagic areas are often found in these tumors. Areas of dense and even calcareous tissue are also frequent. Many tumors are found in which a part or all of the tissue within the capsules has become liquified. The contents of such a degeneration cyst are amber color or hæmorrhagic. They practically always contain cholesterine crystals.

The surrounding gland in which these tumors are present, presents the same acinar characteristics which have been described above for the symmetrical thyroids. In the majority of specimens the surrounding gland is composed of the colloid and foetal acini (Fig. II-A.). The acini do, however, sometimes present a picture of pressure atrophy, which is not seen usually in the uncomplicated symmetrical thyroid. One may describe adenomata of the thyroid according to the following descriptive key.

These anatomico-pathological observations may be studied in the light of chemical and experimental work.

The main features connected with the experimental findings relative to the thyroid may be briefly stated to have begun with Reverdin's (1882) observation regarding the severe disturbances, which he found to occur in man, after total extirpation of the thyroid. This observation was followed by Schiff's efforts (1894) to transplant thyroid tissues after thyroidectomy. The results were not completely satisfactory although they gave sufficient encouragement for further investigation. Bircher (1890) tried the effect of transplanting thyroid tissue into a myxœdematous patient. His efforts were followed by good but not perfect results. Horsley (1890) transplanted the thyroids of monkeys and sheep without striking results. The imperfect results of these experiments were considered to be probably due to the method of transplantation. V. Eiselsberg, therefore, acting upon this supposition, transplanted the thyroid into the abdominal

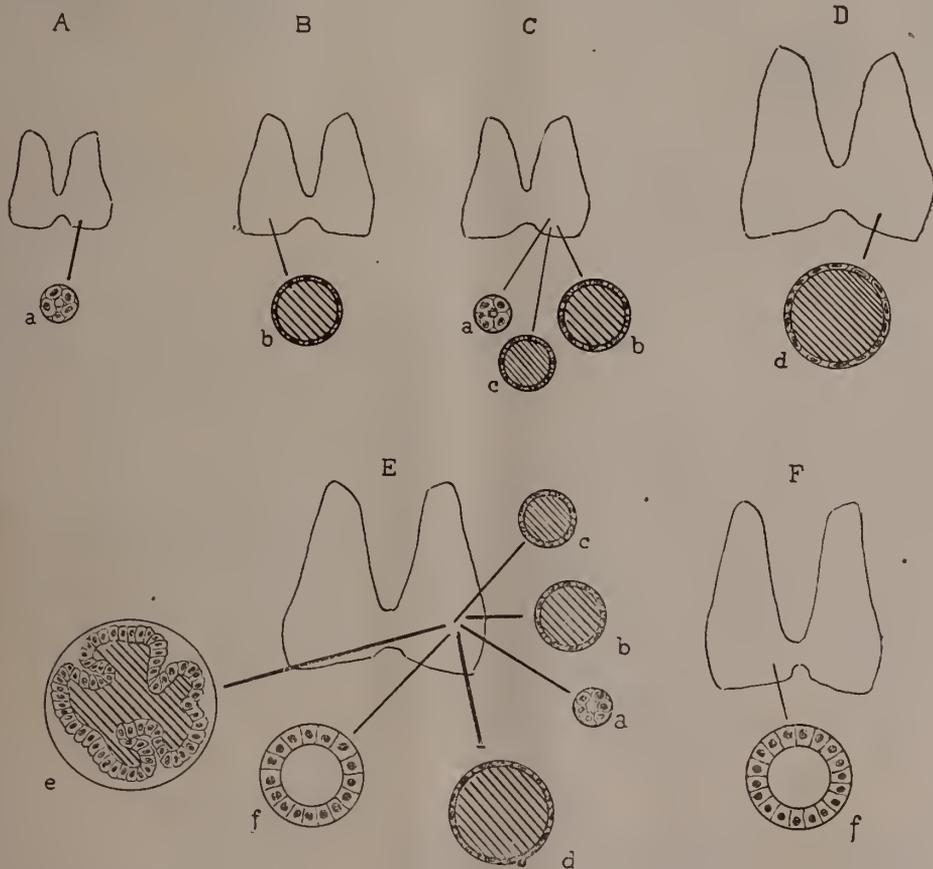


FIG. 1.—DIAGRAMS OF SYMMETRICAL NORMAL AND PATHOLOGICAL (GOITEROUS) THYROIDS.

- (A) Foetal thyroid with a foetal glandular unit (a).
- (B) Adult thyroid and adult unit (b).
- (C) Adult thyroid with adult and foetal units (a, b, c).
- (D) Hypertrophic thyroid showing a dilated acinus or unit filled with colloid (d).
- (E) Hypertrophic thyroid with some areas of foetal, normal, dilated, hypertrophic parenchymatous units (a, b, c, d, e, f).
- (F) Hypertrophic thyroid (meaty) with hypertrophic parenchymatous units (f).

cavity of thyroidectomized animals. His work led him to say that further work would be necessary before definite conclusions could be made. Payr (1906) transplanted the thyroid into the spleen in thyroidectomized animals without great practical results. Other experimenters have repeated these experiments with results which

of the body. From his work detailed studies have developed upon this constant constituent with the discovery of its incorporation with protein cellular constituents. The iodized proteid was given the same iodothyryn or iodothyroglobulin. The essential nature of the gland and the chemical findings gave rise to speculation

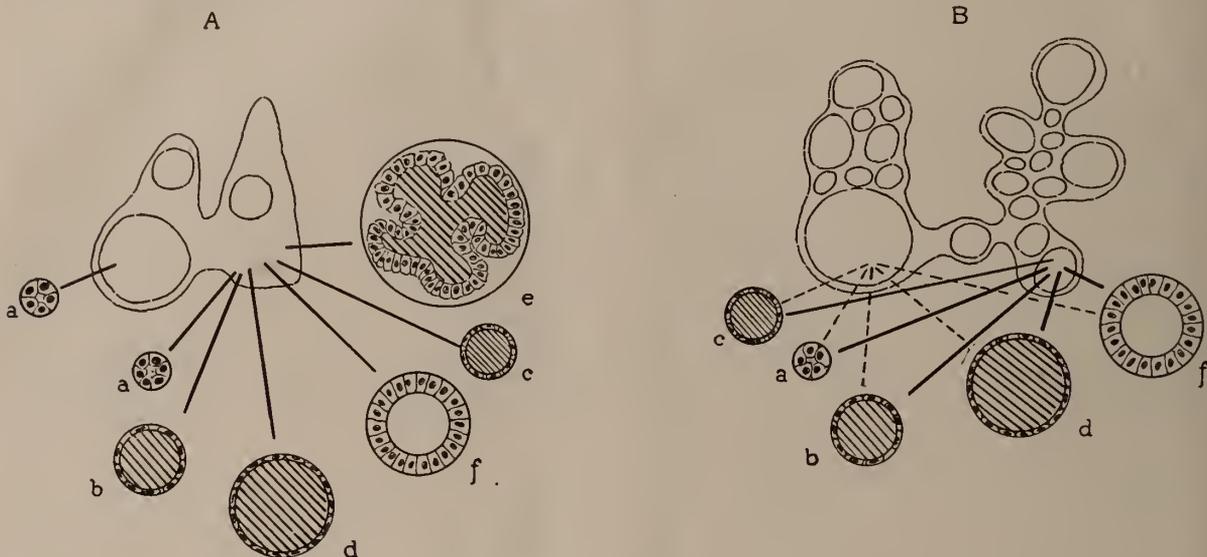


FIG. II.—DIAGRAMS OF ASYMMETRICAL PATHOLOGIC (GOITEROUS) THYROIDS.

(A) A thyroid containing a simple adenoma with its fetal unit (a) and the surrounding gland with the various units, which are often found (a, b, c, d, e, f).

(B) A greatly distorted thyroid containing many adenomata and the units, which one often finds in them associated with the simple adenoma units (a).

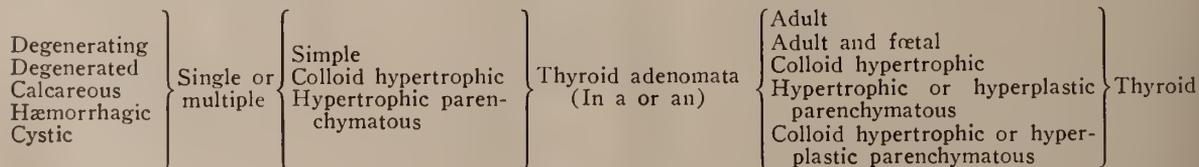
merely demonstrate the essential nature of the organ to animal economy and the relative value of transplantation to therapy.

The relation of the parathyroids to these experiments will not be considered at this time.

Knowledge of the chemical nature and the supposed active principals of the thyroid extends back to a period of several years before animal experimentation upon the thyroid came into use. The iodine content of the thyroid was known to Oidtmann (1858) and the water supply of regions of endemic goiter and cretinism were studied by Chatin (1859). The work of Baumann (1896), however, demonstrated that iodine was a normal constituent of the thyroid and was present in larger proportions than in other organs

which led to various theories namely the "Secretion Theory" (Baumann, Roos, Oswald and others), the "Neutralization Theory" (Notkin and Blum), and the "Biological Reversion Theory" (MacCarty).

The experimental work, which has been done upon the thyroid, especially the work upon extirpation and transplantation, has apparently demonstrated the essential nature of the organ to economy. It has led to the use of thyroid extract, with effective results, in cases of apparent thyroid insufficiency. It has led the surgeon to more accurate surgical procedure and has enabled him to cure many patients and relieve many others.



The gross and microscopic pathology teaches us that the condition, which we call goiter—at least in its more advanced condition—is something more than a localized condition. The thy-

roid itself is but a part of a pathologic complex, which makes up a clinically complex picture, especially in cases of hyperthyroidism. In spite of the excellent chemical, surgical, clinical and path-

ological research, which has given us a much clearer idea of goiter, very little is known about the etiology or indeed the physiology of the gland itself.

New paths of research should be utilized in conjunction with the research, which has already been done.

Not until gastric juice had been obtained by means of a fistula were we able to obtain the slightest conception of gastric secretion. Not until then were we able to study the properties of gastric juice and the actions of stimuli upon its production. Not until we were able to collect saliva from the salivary ducts were we able to study the chemical and physical properties of its active principle and to control its production by stimulation.

These facts are so clear and our knowledge so empirical and so limited that they make us fear that the truth about the thyroid is far distant.

The field, however, should not be a discouraging one. Indeed it is filled with the greatest and broadest interest and possibilities because it involves something more than experimental surgery and chemistry; it involves, first of all, the discovery of an experimental animal with a patent thyroid duct from which secretion may be obtained. This is the work of a zoologist or zoological physiologist and his attention should be drawn to its broad experimental interest and practical significance.

Somewhere in the animal kingdom there is probably a thyroid which functionates normally with a patent duct or analogous organ. Whether this animal is aquatic, terrestrial or both is so far as the writer knows still undetermined.

This brief academic review is but a confession of our limited scientific knowledge of the thyroid and its pathologic condition which we know as goiter.

Goiter is not a simple condition. Its pathology demands something more than text book diagnoses of "exophthalmic" and "colloid" goiters to be handled by simple types of treatment be they medical or surgical.

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THE RESULTS OF THE EARLY DIAGNOSIS OF URINARY TUBERCULOSIS.*

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NOTWITHSTANDING the fact that much has been said and written in the past few years concerning tuberculosis of the kidney, most of the patients suffering with this disease are not referred for operation until the process is well advanced. Up to January 1, 1912, the records at St. Mary's Hospital, Mayo Clinic, show that 212 patients were operated for renal tuberculosis. Of this number, 159 patients (71 per cent.) had symptoms suggestive of renal tuberculosis which had extended over a period of more than one year, 37 (17 per cent.) over five years, and 13 (6 per cent.) over ten years. Only 61 patients (29 per cent.) had symptoms of less than one year's duration, and but 21 (10 per cent.) less than six months. During the past ten years we have examined 71 patients who, because of complications or because both kidneys were diseased, were regarded as inoperable. Of this unfortunate number, 61 (86 per cent.) had symptoms of renal tuberculosis extending over a period of one year, 34 (48 per cent.) over five years, and but 10 (14 per cent.) less than one year.

The question naturally arises, How is it possible that the tuberculous process should be allowed to go on so long without surgical intervention? The more important reasons appear to be as follows: (1). The true nature of the disease still too frequently goes unrecognized by the general practitioner. (2). It is not generally known that surgery is the best means to cure tuberculosis of the urogenital tract. (3). There exists a widespread belief that renal tuberculosis can frequently be cured by means other than surgery, particularly through the use of tuberculin.

That the presence of renal tuberculosis is usually recognized through the irritability which it causes in the bladder is a fact frequently disregarded. For the best interests of the patient it would be well to regard every case of diurnal irritability of the bladder persisting over a period of several months and accompanied by more or less pyuria as due to renal tuberculosis until it can be proved otherwise. However, we undoubtedly meet with a large number of cases of irritability of the bladder from causes other than renal tuberculosis. Excluding those patients hav-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

ing symptoms of prostatic and urethral obstruction, we have examined, during the past year, 327 patients complaining of irritability of the bladder and a diagnosis of renal tuberculosis was made in but 39 of these. The remaining cases may be grouped into two divisions: (1). Those with little or no actual inflammation of the bladder. (2). Those with cystitis. The first group is by far the larger, including 201 patients in whom cystoscopic examination showed little or no inflammation. This group of cases is composed largely of women of the fourth or fifth decade, and with many of the vesical symptoms seem to be a form of neurosis. The majority of these cases can be recognized by the fact that the patients have little or no *nocturnal* frequency, and also by an examination of their urine, which usually shows little or no pus. The symptoms, moreover, while extending over a period of months or years, will not be persistent. The other group of non-tuberculous cases was composed of the following forms of cystitis: (1) Non-specific cystitis; (2) pyelitis and cystitis; (3) cystitis accompanying vesical neoplasm and stone; (4) cystitis with infections in the prostatic urethra. This second group might readily be confused with renal tuberculosis, since considerable pus and persistent irritability of the bladder may be common to both. These cases will require further differentiation. While vesical symptoms are usually first to call our attention to the existence of a renal tuberculosis, occasionally the initial symptom will be a pain referred to the affected kidney which may become very severe. In exceptional cases a sudden hematuria will be the first indication of the infection. However, these symptoms are early accompanied by irritability of the bladder and various other evidences of renal tuberculosis. Strange to say, the most common diagnosis and the condition for which many patients had been treated was that of Bright's disease. The diagnosis was frequently made because albumen was found in the urine, no further urinary examination being made. Gonorrhoea was also often assigned as the cause of the vesical symptoms, in spite of the fact that Neisserian infection is found in but a few cases as a cause of cystitis.

Given, therefore, a patient with persistent irritability of the bladder, what steps are to be taken to determine whether or not the symptoms are caused by renal tuberculosis? First, a careful examination of the urine. If no pus be found even through microscopic examination, tuberculosis can be excluded in most cases. With pus present in considerable quantities the early diagnosis of tuberculosis becomes largely a problem of demonstrating the presence of the tubercle bacillus. It is peculiarly true that sputum is examined for tubercle bacillus as a matter of routine by hundreds of clinicians, but the urine seldom is examined, although the technic is practically the same. The tubercle bacillus can be found in the urine of practically every case of

early renal tuberculosis if looked for *repeatedly*. If, however, with a case of persistent diurnal irritability of the bladder and pyuria, the tubercle bacillus cannot be found microscopically in a catheterized specimen of urine and we have reason to suspect its presence, a guinea pig should be inoculated with the sedimental urine. Particularly in early infections is the guinea pig test practically infallible and it is unfortunate that because of the expense, technical difficulties and length of time involved, the method is not more generally available. The diagnosis of early renal tuberculosis, therefore, will be largely dependent upon these two methods.

When, however, the guinea-pig test is not available, and the microscopic examination is necessarily uncertain, we have other evidence which is corroboratory of the condition, namely, cystoscopic and physical examination. The presence of nodular enlargement of the epididymis or prostate is of particular value in physical examination, and it should be looked for in every case of irritability of the bladder in the male. In fact, when such enlargement is found in a young adult without recent venereal infection or *nocturnal* frequency the diagnosis of renal tuberculosis can be made safely. Thickening of the ureter, renal tumor, temperature, loss of weight, radiographic data, etc., usually appear later in the progress of the disease. Without going into the details of the cystoscopic picture of the tuberculous bladder, suffice to say that while it is not necessarily pathognomonic, particularly in the early stages, it can nevertheless usually be recognized by an experienced observer. The various tuberculin reactions, including cutaneous and Calmette's tests are not of great practical value, since, while a positive reaction may be indicative of tuberculosis, it is of no value in localizing the process.

Localization of the disease is the next and a very important step to complete our diagnosis. This is entirely a question of cystoscopic technic and it is frequently a most difficult one even in the hands of an experienced observer. By means of the cystoscope we are able to determine (1) the degree and character of the infection in the bladder; (2) whether the infection is secondary to the kidney or to the epididymis and prostate; (3) which kidney is involved and the degree of involvement; (4) to a certain extent the functional capacity of the remaining kidney; (5) whether both kidneys are involved.

Granted, therefore, that negligence accounts to some extent for the fact that the true nature of the irritability of the bladder in a large percentage of cases of long standing is not recognized, there is still an unfortunately increasing proportion in which the nature of the disease has been recognized, but treated by non-surgical measures. The various methods by which renal tuberculosis has been claimed to be cured are as follows: Spontaneous, climatic, heliotherapy, and tuberculin. Within the last few years we have

records of a number of patients who have been treated by various means and particularly with tuberculin over a period of several months or years before presenting themselves for operation, and in none of whom was any permanent improvement noted. While it may be true that incipient renal tuberculosis may occasionally recover spontaneously, it has been our experience that such a case is so exceptional that it should not be relied upon. Our files up to January 1, 1912, record 283 cases diagnosticated as renal tuberculosis. Two hundred and twelve patients have been operated upon, leaving 71 who were not operated upon. Of those not operated upon we were able to trace 48. Ten patients were reported able to trace 48. Ten patients were reported alive: 2 between five and ten years, 3 more than three years, and 4 more than one year. Of this number, we have found but three in whom the tubercle bacillus has disappeared from the urine and in whom the vesical symptoms have ceased. Two of these cases are of less than five years' duration and the third is of eight years' duration. It is of interest to note that the three patients were young adults less than 20 years of age, in whom the progress of the disease is usually more rapid than in patients above 40. There are left then 38 patients who are known to have died or a non-operative mortality of 80 per cent. These figures probably do not represent the exact truth in leaving the non-operative cure of 20 per cent. since, in the first place, but few patients will survive after ten years and, secondly, the majority of those not traced are probably dead. Of those regarded as inoperable, our records show 26 patients in whom both kidneys were infected. Twenty of these gave a distinct history of infection in the second kidney from two to ten years after the first kidney became diseased. Although we advised 12 of the latter to try tuberculin, all with one exception have since died.

The patients who were operated upon included 14 in whom the symptoms had practically ceased for intervals of several years, in 4 cases as long as ten years and in one case twenty years. Cystoscopic examination in these cases demonstrated absence of secretion from one kidney and obliteration of its ureter. This condition is the result of a process which has been called autonephrectomy. It is undoubtedly far more common than is generally believed and accounts for a large number of so-called spontaneous cures. At operation, the kidney is found to be necrotic and filled with a caseous or semi-solid purulent substance, which had persisted for many years as a menacing source of infection. While a good many sporadic cases of so-called recovery have been reported by various observers, but few of them have been observed long enough—at least ten years—to determine whether or not recovery is permanent. If spontaneous recovery were as frequent as is claimed by some observers, we should at least

occasionally find evidence of healed tuberculous kidneys. But few, if any, of such specimens have been reported. Israel states that tuberculin is of no value whatsoever in the treatment of renal tuberculosis and should not be used even in the very earliest stages of the infection. Blum recently reported 26 cases not operated upon of whom 22 died in from one to three years after observation, many of whom were bilateral however.

Wildbolz, in the last German Congress of Urology, reported a careful study of 316 cases of renal tuberculosis treated in Switzerland by various Swiss physicians, by methods other than surgical. His summary is of exceptional value and quite conclusive, since Switzerland is particularly supposed to have climatic conditions favorable for the treatment of tuberculosis, and contains many sanatoria for that purpose. All of his patients had careful bacteriologic and many of them had cystoscopic examination made. After death post-mortem records were available in many. Of this number, he reported that 70 per cent. had died, 60 per cent. in less than five years. Most of them died of complications resulting from infection in the urinary tract. Only 10 per cent. were alive more than five years after the beginning of the disease; in only 5 per cent. had all symptoms ceased over five years; and but one case was positively well in every respect. These observations agree with those made at the Mayo clinic and prove quite conclusively that permanent recovery from renal tuberculosis without surgical removal of the diseased kidney is exceptional and not to be relied upon.

It is generally recognized that the results of surgical treatment, while not satisfactory in every case, are followed by cure in the majority. In a recent paper I gave the results obtained in 203 cases operated upon at St. Mary's Hospital for renal tuberculosis. The immediate operative mortality (2.9 per cent.) was so low as to be practically disregarded. Those patients operated upon during the current year (18) and those that could not be traced (43) were excluded from the summary of first operative results, leaving but 142 patients, or 70 per cent. of the total number to be considered. Of this number, 116 (82 per cent.) were reported alive more than a year after operation, 98 (69 per cent.) being well or greatly improved, and 18 (13 per cent.) reported little or no improvement in vesical symptoms. A closer analysis of those reported with symptoms unimproved shows that 83 per cent. had a history of infection of more than two years' duration. Of those patients who had symptoms of less than one year's duration, 81 per cent. were well or markedly improved. Furthermore, the convalescence and relief of symptoms of those with recent infections was much earlier than those of long standing infection. Worthy of note is the fact that 22 per cent. of those reported dead had symptoms of a year or less. It is hardly conceiv-

able, however, that the operation would materially influence the patient's resisting power. The prognosis of patients operated upon in less than a year after the onset of symptoms is, as a rule, much better than those operated upon later.

It has been claimed that the high death rate during the first year after operation (in our series 61 per cent. of all reported dead) goes to prove that the operation was the cause of death. While it is possible that the operation may in some way lower the already weak resisting powers, it seems more logical to suppose that the patients would have succumbed to the disease even if not operated upon. While it is true that complications outside the urinary tract do not necessarily contraindicate operation, nevertheless when present the prognosis is rendered less favorable. Evidence of previous complication was found in 19 per cent., and active lesions in 10 per cent. of the patients operated upon. Of those reported dead, 41 per cent. had some evidence of extra-urinary complication at operation. Renal tuberculosis, secondary to pulmonary tuberculosis, was found in but 4 of the 283 cases observed and all were inoperable. Pulmonary tuberculosis, secondary to renal tuberculosis, was found in 26 patients, most of whom had a renal infection of several years' standing, excepting 2, who had miliary tuberculosis. Twelve of the patients were operated upon, 6 of whom were reported alive. Of the latter, 3 had but slight involvement and 2 were doubtful. The remaining 14 cases were terminal complications of long standing renal infection. Bone and joint tuberculosis as a complication seemed to have a more favorable prognosis. Spondylitis appears to be exceptional, however, since the three patients with spondylitis were reported dead within a year following operation. Marked involvement of the prostate gland renders the prognosis less favorable. Of the 24 males with such involvement who were operated upon, 11 (46 per cent.) were reported dead. Stricture of the urethra was found in 12 cases. In nine instances it was found in cases considered inoperable. In the three patients operated upon, two were reported dead within a year after operation. The stricture occurred usually in cases of long standing infection and recent bilateral complication, or in cases of rapid and virulent infection.

The following complications might be considered as the principal contraindications to operation: (1) Advanced pulmonary infection; (2) multiple accompanying lesions such as in the joints and bones, prostatic abscess with perineal fistula; (3) peritonitis; (4) marked bilateral involvement; (5) clinical evidence of renal insufficiency. The prognosis of a patient whose kidney has been removed for tuberculosis will depend largely upon his resisting power to future tuberculous infection in other parts of his system. It would be unreasonable to suppose that nephrectomy would increase this resisting power other than to remove an active source of infection. Whereas outdoor life, rest, etc., are of lit-

tle value in the cure of an active renal tuberculosis, it is of considerable value in the prophylaxis of post-operative tuberculous complications. The question has arisen: How soon after the detection of the disease should the kidney be removed? It has been argued that enough time should be given for the normal kidney to gradually hypertrophy. However, experience has shown that a normal kidney can readily perform the function of two when the second kidney is suddenly destroyed. Rather than risk spreading the infection, it would seem that the kidney should be removed as soon as the tuberculosis lesion can be ascertained.

Conclusions: (1) The existence of renal tuberculosis should be suspected in every case of persistent diurnal irritability of the bladder. (2) No such case should be treated without a thorough examination of the urine for the tubercle bacillus. (3) Early nephrectomy offers the best chance for cure. (4) The longer the patient's bladder is infected, the slower is its recovery in spite of nephrectomy. (5) With most cases of bilateral infection the second kidney becomes infected some time after the first kidney is diseased and the infection is evidently transmitted from it. (6) Non-operative cure, either spontaneous or through the use of tuberculin, climatotherapy, etc., is exceptional and at best symptomatic. (7) The risk of severe vesical infection and of transmission of the disease to other parts of the body through delay is too great to warrant the small chance for cure by non-operative means.

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Discussion.

DR. HENRY D. FURNISS: The excellent and practical paper of Dr. Braasch should awaken all of us to the realization of the importance of the early diagnosis of renal tuberculosis. The cases I see are seen in the practice of gynecology, and are encountered with greater frequency than one would imagine.

Any bladder irritability, especially in young women, should be thoroughly investigated, and the idea that possibly the underlying cause is renal tuberculosis should not be relinquished until excluded by the best methods of diagnosis we have. Should we fail to find tubercle bacilli in the urine microscopically, guinea pigs should be injected. If at the end of three or four weeks there be no evidence of tuberculous infection in them, the animals should then be given tuberculin. If they have been infected with tuberculosis we get a reaction or death, according to the amount of tuberculin injected.

Dr. Braasch mentioned the neuroses of the

bladder, and stated that in these cases there was marked diurnal, but little nocturnal frequency of urination. In such cases I have found almost constantly either a trigonitis or urethritis. But in cases of frequency of urination from renal tuberculosis, with the secondary bladder involvement, there is a relation between the diurnal and nocturnal frequency.

Hæmaturia is an early symptom. It may occur only once or twice for a day or two, and afterwards we may be able to detect blood only with the microscope. Tubercle bacilli may be found before pyuria, and extensive renal destruction may occur before the pus in the urine reaches any great amount.

Renal tumor; this may or may not be present. In about 50 per cent. of the cases I have seen, the kidney has not been enlarged, and in some it has been smaller than normal.

After severe cystitis has developed it may be impossible to cystoscope the patient with a water dilating instrument, but in these cases a satisfactory examination can nearly always be made with the patient in the knee-breast posture with a Kelly cystoscope; and this with little pain if gently done. At such a stage the ureter of the affected kidney can always be felt through the vagina.

Our hope in these cases lies in early nephrectomy while the lesion is limited to one kidney and before the bladder is much affected. A patient with tuberculous cystitis is in a most pitiable condition, and this can be prevented by early operation.

THE DIAGNOSIS AND TREATMENT OF INTESTINAL OBSTRUCTION.*

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I SHALL endeavor to make this paper thoroughly practical in the brief time which is at my disposal. I shall have to omit much that would be interesting to discuss. This paper deals only with some form of mechanical ileus, leaving out of consideration the paralytic variety, *i. e.*, that due to peritonitis alone.

I shall put myself in the place of a physician who is called to a possible case of acute intestinal obstruction. It may be within a few hours of the onset of abdominal colic with vomiting, constipation, and with some distension of the abdomen. The first care should be to exclude external strangulated hernia, not only carefully examining the inguinal and femoral canals but also the less common situations of hernia, the obturator foramen and sciatic notch. Should there be any fullness, or the least suspicion of strangulation in any of these regions, an exploratory incision should be performed at once. Failing any sign of external hernia, the abdomen should be carefully examined by inspection, palpation, percussion and auscultation.

The rectum and vagina should be examined with the finger and also bimanually. At times something may be learned by distending the colon with fluid or air through a rectal tube. Should a distinct tumor be detected in the abdomen or pelvis, or a stricture be felt by the finger in the rectum, or blood and slime cover the finger inserted into the rectum or escape by the anus and a sausage shaped tumor be detected by the abdomen or rectum, or the bowel be found loaded with hardened fæces, then we may make a diagnosis of tumor obstructing the bowel, or stricture of the rectum, or intussusception, or impaction of hardened fæces. It must be remembered that in infancy, intestinal obstruction is apt to be set up by some congenital malformation, especially in connection with Meckel's diverticulum; in childhood, commonly by intussusception; about puberty, by bands produced by peritonitis, tuberculous or otherwise, or by troubles set up by the appendix; in middle life, besides the appendix, internal hernia, volvulus, bands, and impaction of gallstones may be expected. In older patients the obstruction is more likely to be set up by malignant disease, unless due to fæcal impaction.

Should the patient fail to show anything on physical examination, Johnson's advice should be remembered: "When called to see a patient who has an attack of abdominal pain and vomiting, the physical examination being negative, see and examine that patient again in six hours, and visit him, at suitable intervals, at least twice during the following day." A small initial dose of morphine is permissible but should not be repeated until a diagnosis is made. Atropine may help to relax the bowel. The bowels should be emptied if possible, a mild cathartic being administered at the outset and an enema of a half pint each of milk and molasses mixed together being given. Turpentine stupes may also be used to advantage. In intestinal colic, the pain is intermittent and abdominal tenderness and rigidity are absent. Firm pressure on the abdomen relieves the pain. The pulse and temperature are not affected. There usually is no great degree of vomiting. The attack is over when the bowels act well. The initial cathartic should not be repeated until one is quite sure that there exists no peritonitis nor obstruction. High enemata should be repeated a number of times until one is quite confident that there is either no obstruction present or that there is one. An initial movement does not rule out an obstruction since the fecal material passed may be in the intestines below the obstruction. Pain is always the first symptom in appendicitis, which is then followed by vomiting. The pain is epigastric or umbilical at first, later localized in the right iliac fossa. Should vomiting be the first symptom followed by pain, then one can say that appendicitis is probably not present. The finding of localized tenderness and rigidity in the right iliac fossa would set the diagnosis at rest.

The symptoms common to all varieties of in-

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testinal obstruction may be said generally to be pain, vomiting, constipation, and more or less distension of the abdomen. They will vary according to the pathological conditions upon which the obstruction depends and the site of the obstruction. When the obstruction is sudden, and is attended by strangulation of a portion of intestine such as occurs in the constriction produced by bands, the slipping of a piece of intestine through a hole in the mesentery or omentum, or into a retroperitoneal pouch, volvulus, external strangulated hernia or acute intussusception, the symptoms are severe. The pain is violent, occurs suddenly in a person in previously good health, and is referred to the umbilical region rather than to the site of the lesion; the vomiting comes on early, at first the contents are upper smaller intestinal, bilious, later becoming darker and darker with an increasingly fouler odor, to become before long fecal; after a possible initial movement, constipation becomes absolute and no flatus is passed by the anus; the urine may be scanty and high colored or suppressed; there is frequently hiccough and tympanites; the temperature is below normal; the pulse rapid and feeble; the tongue is coated and quickly becomes dry and brown; the face is pale and bathed in cold sweat; the collapse increases; and the patient dies of septic poisoning, the rapidity of it depending on the quickness with which strangulation is produced. The pulse is probably the best indicator of the severity of the process, an increasing rate meaning obstruction in the absence of peritonitis.

When on the other hand, the obstruction comes on more slowly and a portion of the intestine is obstructed rather than strangulated, as occurs in progressive stricture of the colon or rectum, or from the pressure of an abdominal or pelvic tumor, or the glueing together of the intestines by chronic peritonitis or cancer, or chronic intussusception, or the impaction of a gall-stone or other foreign body, the symptoms are insidious in their onset and chronic in their course. Obscure abdominal symptoms may have existed for some time. The pain is less severe, more localized, and usually intermittent but increases with the distension. Vomiting only occurs late in the course of the disease and does not become fecal until the last. Constipation is not complete at first, the motions may be scybalous, and there may be a history of alternating diarrhoea and constipation. The distension of the abdomen is gradual and coils of intestine may be visible owing to increased peristalsis consequent upon hypertrophy of their muscular coat. Visible peristalsis is always a sign of some obstruction to the fecal current. Gurgling sounds are often heard on auscultation. Borborygmi are frequent and tend to become more and more foul, even if the patient should not vomit. The urine is normal. Several similar attacks may have occurred, with periods of quiescence, in which the patient is

apparently quite well. Collapse does not come on till the end.

Such broadly are the symptoms attending acute and chronic obstruction. But it must not be forgotten that the conditions which commonly give rise to chronic symptoms may at any time suddenly terminate in complete obstruction and strangulation, when the symptoms at once become acute. Thus, a slowly contracting stricture may become suddenly obstructed by the impaction of feces or by a portion of intestine, immediately above, becoming invaginated into it, or infective peritonitis may suddenly intervene, owing to the giving way of an ulcerated portion of intestine above a stricture, etc., etc.

Before assuming that true obstruction is present it is very important to examine the urine. According to Paul Delbet (*La Presse Med.*, Aug. 24, 1907), the possible existence of constipation in the course of uræmia is most important because, if one considers that uræmia may long remain latent; that it may provokè, as its first symptom, gastric intolerance with vomiting, first alimentary, then bilious; that there may be a sub-normal temperature and a slackening of pulse, one can understand that constipation, accompanied by these symptoms, may give the appearance of true intestinal obstruction to a complaint which is entirely non-surgical. A patient in my practice recently was of this type and caused me a vast amount of anxiety. A woman of 21 had had nine months previously both tubes and ovaries removed in Cincinnati. Ever since this operation she had had severe pains in right side and back. Nothing had seemed to do these pains any good, so I explored her abdomen, and found the omentum adherent to the old scar, and also removed a chronic appendix. She was put on the routine post-operative after-treatment, of colon irrigations for thirty minutes, every eight hours, alternating with salines by the rectum every eight hours. For five days after the operation this patient vomited everything that she took and often between times, despite numerous lavages. The vomitus on the fourth day became dark and bilious. Constipation was almost absolute despite the irrigations and enemata and cathartics by mouth. Occasionally a little flatus would be passed by rectum with an irrigation. She complained of severe agonizing cramp-like pain in the region of the splenic flexure. There was no distension but some tenderness in the left upper abdomen. Before the operation the urine was normal. After the operation there were albumin and granular and hyaline casts. On the third day acetone and diacetic acids made their appearance in the urine, which was passed in fair amounts. The temperature remained normal throughout and the pulse never became elevated above 100. On the night of the fifth day, I resolved to try a final gastric lavage and a milk and molasses enema and, if she were not better on the next day, to operate for a possible obstruction. She was

vomiting furiously and but an exceedingly small amount of flatus only had been obtained from the rectal irrigations. Her general appearance was not one of acute obstruction; she did not have that anxious and pinched look that one sees in such cases and her pulse did not go above 105, and there was no distension. Yet I could not account for her severe abdominal cramps, her constipation and her vomiting on any other basis than as being due to a high intestinal obstruction. Her nephritis did not seem to be severe enough to account for all her constitutional symptoms. During the night of the fifth day after operation she had a defecation in answer to an enema, her vomiting suddenly ceased following a lavage of the stomach, and she slept soundly without a hypnotic for the first time since the operation. I can account for her symptoms only on the basis of a nephritis.

Some cases of acute intussusception present puzzling symptoms in making a diagnosis. Such a patient I had in January. A boy of five years was brought into the hospital one Saturday evening. His mother said that he was seized two days before with abdominal cramps, vomiting and bloody fluid movements. On admission his temperature and pulse were normal but the history was most suggestive of intussusception. The child was in no apparent pain. The finger in the rectum detected no mass nor was there any blood on it. By abdomen there was nothing felt save under the upper left rectus muscle where there was a slight sense of resistance. There was no distension. The boy was given castor oil that night. The next morning he was perfectly comfortable and happy. He had not vomited. As the result of an enema, there were two dejections, discolored by fecal material but without blood. Abdomen not distended and nothing could be felt in it save a very indefinite sense of resistance in the lower part of the epigastrium. On Monday morning, the second day after his admission, there was a change in his general appearance. He seemed prostrated somewhat and his eyes were slightly sunken. Temperature normal and pulse 90. He had not vomited since admission nor had he had a satisfactory movement. He had passed no blood. The upper right rectus was more rigid than yesterday and more so than the upper left rectus. There was practically no distension. No mass could be felt. A final enema was ordered and operation decided upon in case there should be no movement. The child did not cry at all with pain. There was no result from an enema, so at 3 P. M. I operated, two days after his admission. I found an intussusception of the small intestine into itself, at about ten inches from the ileocecal valve, extending through the valve into the transverse colon, its apex being just to the left of the median line. Its reduction was easily accomplished by milking. The child made an uneventful recovery. There is no acute condition in the abdomen which pre-

sents such variations from the typical text-book picture as acute intussusception. There may be no rigidity or tenderness since in the beginning there is no peritonitis, and there may be no tumor palpable. Pain may be of slight degree only.

There is a class of cases which comprise some of the rarer lesions of the abdomen, the diagnosis of which, before operation, seems impossible, yet, if but the necessity for operation be recognized early enough, no harm is done. One or two of such cases are as follows: A wrong diagnosis of intestinal obstruction was made in each case.

Man, aged sixty-seven years. Admitted August 20, 1911. Ambulance at 3 P. M. Operator, Dr. McWilliams. Complaint, pains all over abdomen, mostly on right side. About two months ago patient had very severe attack of pain on right side just below ribs. Had to stop work for a week. Had constant attacks of nausea and vomiting. Appetite poor. Bowels constantly constipated. Pains gradually wore away. Well until yesterday when suddenly, while bending over a lathe, sudden abdominal pain, so severe that patient could not stand up and knees were drawn up while in bed. Pain was all over abdomen, but most of the tenderness below ribs and lower down on right side. Nausea was extreme and he vomited a great deal of greenish-brown fluid. Took cathartic and bowels moved well.

Examination.—Markedly prostrated, tongue heavily coated. Pulse 88, fair force, slightly irregular. Temperature 99.4°, leucocytes 24,000, polymorphonuclears 92 per cent. Abdomen held rigid, tympanitic over all, with partial obliteration of normal liver dullness. Entire right side of abdomen very rigid, board-like as one finds in stomach perforation, extending to a less degree to left rectus. Excessive tenderness just above right internal ring. Left inguinal hernia, but easily reducible. Right external ring dilated but no impulse. No peristalsis could be heard over abdomen. Some tenderness on rectal examination.

Clinical Diagnosis.—Intestinal obstruction, origin unknown.

Operation at once. Kammerer incision over appendix. Bile poured out of wound in great amount. Removed by passing Blake's irrigating tube into pelvis. Vertical right upper rectus incision. Large amount of bile escaped with particles of fibrin mixed with it, and pus. Large perforation of fundus. No stones in bladder, but finger felt a large rough one impacted in cystic duct. Extracted with Blake's gall-stone forceps. Common duct free, but foramen of Winslow obliterated. Rubber tube sewn into opening in gall-bladder, and the edges of the bladder inverted about the tube by two purse-string sutures of plain catgut. Two rubber tubes, one containing gauze strip, into Morrison's pouch. One tube in appendix wound. Both wounds closed about tubes.

Patient made an uninterrupted recovery. Dis-

charged September 22, 1911, to his own physician, a granulating wound discharging a small quantity of bile. Patient seen, December 1, 1911. Entirely healed and perfectly well. No gastric nor intestinal disturbances.

A woman of 48 years of age was admitted to the hospital with the history that for three days she had had no bowel movement. She had not vomited. She had had two doctors who sent her to the hospital with the diagnosis of intestinal obstruction. Fourteen years before she had had a hysterectomy for pyosalpinx. She had been constipated for some time. Her temperature was normal but her pulse was 120. The leucocytes were 37,000. She was very fat. The abdomen was distended and was but slightly tender and rigid. No masses could be made out by abdomen or by rectal or vaginal examination. Numerous enemata were given in the hospital but without any result, neither flatus nor fæces being passed. Three hours after her admission I operated with the diagnosis of intestinal obstruction. Median incision below navel. Some odorless serum escaped. The great omentum was adherent to the bottom of the pelvis and on its surface could be seen spots of fat necrosis which made the diagnosis of an acute pancreatitis certain. As so many of these cases are associated with gallstones, I made a second incision over the gall-bladder, in which I felt a single large calculus, tightly wedged in the exit of the gall-bladder. This was removed and a rubber tube was sewn into the gall-bladder. There was no softened areas felt in the pancreas. Two tubes were passed through the biliary incision down to the pancreas. Examination of a stool after the operation showed that there was 40 per cent. of undigested fat in it, and that the trypsin and diastatic digestions were much diminished. The fermentation test gave one-half inch of gas in the arm of the tube. The patient made an uninterrupted recovery.

Cases of intestinal obstruction following appendicitis operations are most perplexing and disturbing, yet their prompt recognition is absolutely necessary to save the patient. They may be roughly divided into three classes: 1. In the early days after the operation there may persist a paralytic ileus due to sepsis from peritonitis or the ileus may be due to the pressure of an abscess or to the handling at the operation. This paralytic ileus may become changed into a mechanical one consequent upon adhesions.

2. Obstruction may be caused by pressure of tubes or dressings. This is relieved by withdrawing the tube.

3. Late obstruction due to organized adhesions. Kinks are produced or bands which lead to strangulation ileus.

The following is such a case: A man of 37 years was operated upon for a gangrenous, perforated appendix with an abscess. A cigarette drain and one small gauze drain were inserted,

the latter because of oozing. Was all right for ten days when he began to have abdominal cramps, vomiting and some distention. The next day he was still vomiting, was much ballooned up and there was marked visible peristalsis. There was no result from numerous enemata, so operation was performed. Mechanical obstruction following appendicitis operations is always situated in the small intestine and in the vast majority of the cases is located in the right iliac fossa in the vicinity of the drainage tract. The best approach is obtained through the free peritoneal cavity and not through the adhesions of the old wound. So a median laparotomy incision was made above the pubis. An enormously ballooned coil of small intestines immediately presented in the wound. A purse-string suture of black silk was passed in its wall but not tied.

A trocar and canula attached to a suction apparatus was plunged into the center of this suture and a large quantity of fluid fæces was withdrawn. The suture was then tied after withdrawal of the trocar. This distended coil was then followed over to the right iliac fossa where it was found to be adherent and absolutely kinked, the small intestine distal to this kink being collapsed. After separation of this adhesion, gas passed on into the collapsed intestine freely. No other obstruction was made out. There was no relief following this operation. The vomiting and distention continued and nothing could be obtained by enemata. On the second day, the upper part of the median wound was re-opened but the distention was so enormous that nothing could be done or seen inside the abdomen so an ileostomy was performed at once. A purse-string suture of plain catgut was placed in the wall of the intestine and a rubber tube was passed into the bowel in its center and the purse string suture was then tied about the tube after invaginating the mucous membrane about it. Following this procedure there was immediate relief, the vomiting ceased and the bowels moved. Three weeks later, the ileostomy opening was closed by freeing its edges and sewing them together. The man made a good recovery.

I have collected records of 86 cases of intestinal obstruction following appendicitis operations, of these 57, or 66.3 per cent., recovered after operations to relieve the obstruction, while 29, or 33.7 per cent., died.

Obstruction may occur in the same individual more than once. The following is such a case: In October, 1903, I operated upon a girl of 16 for a gangrenous appendicitis with considerable pus in the pelvis. One rubber drainage tube was inserted into the pelvis and a second one to the stump of the appendix. Convalescence was smooth until the eighth day when during the night she began to vomit. On the ninth day, I pulled out of the wound a small drain which I thought might be kinking the intestines. Examination of the abdomen showed slight disten-

tion, no masses, nor any rigidity nor tenderness. Numerous enemata were ineffectual in evacuating gas or fæces so I at once operated. The patient's pulse was 120 with a normal temperature. The vomitus had become fecaloid. A median incision below the navel was made and a much dilated piece of small intestine came into the wound. Following this over to the right iliac fossa, I came upon a collapsed coil of intestine which was seen to lead into the dilated coil, the point of constriction being formed by a very firm adhesion to another coil. On separating this adhesion, gas passed on into the collapsed coil from the dilated one. The point of adhesion was covered over with silk suture. She made a good recovery from this operation. Her bowels moved four times the next day after the operation. On the 26th day after the appendix operation and the 16th day after the operation for obstruction, she was seized with a violent attack of cramps and vomited. On my seeing her the next morning, she looked prostrated, lay with her knees drawn up in bed and had a pulse of 130. The abdomen was moderately distended but was not tender nor rigid. On getting no result from enemata, I reopened the median wound, and found, near the median line, that a collapsed piece of small intestine had become adherent behind to a much distended loop in front so that as the distention increased the obstruction became more and more absolute. Loosening this collapsed intestine remedied the obstruction. The patient made an uninterrupted recovery. Four years later she wrote me that she had never had the slightest difficulty since the operations.

Obstruction may occur a very long time after an appendix operation. Thus a woman had been operated upon in Philadelphia three years previously for a suppurative appendicitis. She was well until three days before admission to the hospital when she was taken with vomiting and abdominal pains. Her bowels had not moved for two days, and she was hiccoughing. Her abdomen was rigid and tender all over and was distended. By vagina one could feel a soft, tender, indistinct mass extending up into the abdomen above the uterus. Immediate operation was performed. A median incision below the navel was made and the omentum adherent to the pelvis was separated. At once a gangrenous loop of intestine came into view but it was not perforated. The gangrenous coil was isolated and brought into the wound, and it was seen that both extremities of it led over the right iliac fossa, where they were both adherent. A twisting of this loop had taken place with a resulting gangrene. The adhesions were separated, excision between clamps performed, and an end-to-end anastomosis with a Murphy button was made. The patient died on the fourth day, apparently from a continuation of the sepsis.

I once opened the abdomen of a patient suffering from simple intestinal colic, under a wrong

diagnosis of obstruction, much to my own discomfort. The impression it left on my mind was ineradicable. A doctor brought a patient from Sullivan county into the hospital at 10 o'clock at night. She was an eighteen year old girl, who had had an appendectomy two years previously. The doctor had first seen her at 5 o'clock the previous afternoon when she was complaining of exquisite unlocalized abdominal pains, which required one and a half grains of morphine during the night to quiet her. She vomited a number of times during that night. Innumerable enemata had produced no result. On admission her temperature was 101.2° and her pulse 110. The abdomen was tender in the midline and a mild degree of rigidity, but nothing could be felt save some distention. By rectum nothing was palpable. I ordered her given a high turpentine enema and awaited the result, which was reported to me to be entirely negative. The general impression that I got from her inclined me to wait before operating but this was overcome by the doctor's insistence upon my operating upon her as he felt sure that she had an obstruction. So I had her given ether and opened the abdomen in the midline. I found but slight distention and no adhesions anywhere. The whole of the large intestine and a great part of the small was filled with innumerable hard movable masses which felt, through the walls of the intestine, like blackberries. So I closed the abdomen. The next day she was given brisk catharsis and enemata, as a result of which she passed immense amounts of scybalous masses containing blackberries. The doctor's mistake was in not giving a cathartic in the beginning sufficient to move the bowels and in giving morphine in such large doses as to inhibit all peristalsis. My mistake was in not following my own impulses.

It must not be forgotten that simple intestinal obstruction produces a leucocytosis of from 14,000 to 18,000 with a relative increase of the polymorphonuclears. Why this is so has never been satisfactorily explained. I presume it is due to the infection created at the site of the obstruction or to the thromboses of the vessels at that vicinity. In intestinal colic there is no such leucocytosis hence the blood count is of value in differentiating between the two conditions.

Treatment.

Probably in no branch of surgery is such skill required as to successfully treat patients with intestinal obstruction. Skill and speed in locating the obstruction and intuitive knowledge of how best to deal with the condition as found are of the highest importance. Whatever form of obstruction is present and demands operation, there are certain points common to the treatment of all of them which will be briefly touched on here.

Just before the anæsthetic is started, it is wise to empty the stomach by the stomach tube. It is not good practice to use lavage while the patient

is under an anæsthetic either before or immediately after operation because of the danger of aspiration of material into the lungs and the resultant production of a pneumonia. Ether should be the anæsthetic of choice because of its little depressing influence, and as little of it should be used as possible, yet sufficient should be administered to do away with the tendency to vomit. The head should be well turned to the side and sponges be in readiness to swab out the throat should vomiting occur. Intratracheal anæsthesia is an ideal method in these cases.

Should the site of the obstruction be known, an appropriate incision over this region should be made but in many cases the situation of the obstruction is not appreciated. In such, a median laparotomy incision above the pubis had best be made. Through this one can manage practically all obstructions.

The location of the obstruction is next in order to determine. The cæcum is first palpated with a finger or the hand. If this be distended, then the obstruction must be lower down in the large intestine and the hand follows the colon until the obstructing point is reached. If the cæcum be collapsed, then the small intestine must contain the obstruction. A distended loop of small intestine appears in the wound. It is only necessary to follow this downwards to come to the obstruction, but if this is done in a haphazard fashion, time will be lost and shock increased by unnecessary handling. The mesentery of the loop under examination is traced to its origin in the spine and its left surface, which is also its lower surface, is recognized. This followed towards the right will lead one downwards and to the obstruction. If the distended loop, when first felt, contains only gas, then one is distant from the obstruction but if it contains fluid feces and gas, then one is near the obstruction. In all this search, one should not allow the intestines to escape from the abdomen.

But this method may be impossible because of the excessive distension. In such a case Greig Smith recommends that one allow the most distended coil to emerge from the belly. One end of the coil escapes less readily than the other, and appears more congested; this end of the coil, if followed, will lead to the obstruction.

When the gut is excessively distended, it may be deemed wise to drain the bowel of its contents. This is only necessary, however, in case one feels that the gut has been so overdistended that it will be unable to empty itself by the natural channels after the obstruction has been relieved. One of the most distended coils is brought out of the abdomen and allowed to protrude over the side, the abdominal contents being protected by gauze pads. A competent assistant takes over this task and for the work he is provided with sponges, instruments and sutures kept distinct from those used by the operator. A

Pagenstecher purse-string suture is passed in the gut wall but left untied. In its center is plunged a canula to which is attached a length of rubber tubing and the contents of the bowel are siphoned off. By milking the intestines towards the canula, a large area of gut may be emptied. On withdrawing the canula, the suture is tied about it. This drainage may be done in several places if deemed necessary.

If the patient is very much collapsed and is standing the operation badly or, if it is difficult to find and treat the cause of the obstruction, all attempts should be given up to relieve the obstruction and an enterostomy be done in the most distended coil. A flanged glass canula or a rectal tube is inserted into the bowel in the center of a purse-string suture. The bowel about the tube is then attached to the peritoneum of the wound. Many lives have been saved by means of an enterostomy which would otherwise have been lost had time been taken to find and relieve the obstruction. At a later date a second radical operation may be necessary when the patient has recuperated sufficiently.

If after exploratory operation, the cause of the obstruction is found to be irremovable, the best treatment, if the patient's condition warrants it, is to establish an anastomosis between the distended bowel above and the empty bowel below the obstruction. The anastomosis may be a lateral one, or the gut, having been divided above the obstruction, the proximal end may be implanted into the bowel below, *e. g.*, the ileum into the transverse colon, either by suturing or by a Murphy button.

I have had a number of cases where I have side-tracked the obstruction in this way and I have never as yet had a case in which I have regretted doing it. Such a case is as follows: In November, 1909, I was called in consultation to see a boy of 18 who had been operated upon two weeks before for a gangrenous appendicitis and a large abscess which the operator told me with great pride "was so large as to require eleven strips of gauze to fill it." What he wanted to fill it for, I do not know. Two days prior to my seeing him, the boy had been operated upon for intestinal obstruction in which two bands had been divided and a kink relieved. No relief was obtained when I saw him from this operation. His pulse was 120 and he was moaning with paroxysmal cramps. His condition was such that the only thing to do was to make an artificial anus which was at once performed in the median wound. The relief was immediate. Six months later the boy came under my care for the closure of the anus. At the operation the opening was circumscribed and the loop containing it was freed and drawn out of the abdomen. Subsequent events showed that at this point I committed an error in judgment. I should have resected the gut containing the anus, making an end-to-end anastomosis. Instead I deemed this

not necessary but turned in the opening in the gut and closed it with a Lambert silk suture. On the fifth day after the operation, I was compelled to reopen the abdomen for obstruction. I found the loop, the opening into which I had sewn over, buried in a mass of adhesions probably producing a kink. Judging discretion the better part of valor, I isolated the distended loop leading into the adhesions and the collapsed coil leading away from it and then anastomosed these together by a Murphy button. The boy made a good recovery, and has since remained well, it being now two years since the operation.

Time will not permit me to go into the treatment of the individual causes of obstruction except very briefly. In acute intussusception, if the patient is seen within a few hours of the beginning, it may be attempted, although it scarcely seems advisable, to reduce the invagination by distending the colon with gas or water. Later it should not be tried for fear of causing rupture of the bowel. Clubbe advises a forcible oil enema after the child is under an anæsthetic. This is immediately followed by a laparotomy and taxis. He believes that this enema reduces the number of cases requiring resection at the operation. In irreducible cases Maunsell's method of resection seems to be the best to employ. Kredel and Codman have recommended enterostomy in irreducible cases combined with ligation of the mesenteric arteries supplying the intussusceptum with a view of favoring the rapid sloughing and discharge by rectum of the intussusceptum. After the gangrenous mass is cast off, the enterostomy wound should be closed.

In case a foreign body is causing the obstruction, it should be milked to a healthy part of bowel and incised over this.

A curious cause of chronic obstruction and the most frequent cause of volvulus of the sigmoid colon is the so-called "retractile meso-sigmoiditis." From some ill-defined reason the base of the meso-sigmoid becomes covered transversely by bands of scar tissue which contract and in severe cases may bring both segments of the sigmoid together like the barrels of a gun. This can cause narrowing of the lumen and obstruction with subsequent dilation of part of the sigmoid loop and of the descending colon. Distention of the bowel and interference with the circulation are liable to lead to ulceration of the mucosa, etc. Fixation or stiffening of the sigmoid is a predisposing cause of volvulus. The treatment of this meso-sigmoiditis, in case the bowel does not seem severely affected, consists in dividing the bands of scar tissue which contract the meson; in some cases this permits the meson to spread out to its normal extent. If this fails to release the meson or, if the gut is much affected, it is better to resect the involved bowel. In some cases an anastomosis between the proximal and distal segments might overcome the difficulty.

Discussion.

DR. MARTIN B. TINKER, Ithaca: The importance of the subject of intestinal obstruction has always impressed me. One means of determining the location which is now being used is that of the bismuth test meal, followed by an X-ray picture, or a bismuth enema. Ether is not the anesthetic of choice, as the reader of the paper suggests, as the patient is liable to plug the cone with vomitus. Many such operations can be performed under local anesthesia; if not, nitrous oxid gas is preferable.

DR. JOSEPH D. BRYANT, New York: I desire, in no uncertain manner, to emphasize the shunning of the use of cathartic in instances of apparent intestinal obstruction until after substantial diagnosis is made. I admit that not always have I been obedient to this injunction, for it is so entirely natural without injury, when a patient complaining of constipation comes to one for relief, to prescribe at once an active cathartic. In instances of obstruction one should attack the hindrance from below by means of one or more of various kinds of high enemata. I know of nothing better in these instances than a copious high injection of sweet oil slowly introduced with the pelvis raised and retained until released by quite urgent demand. I usually employ this means after primary failure of a more common injection and rarely, indeed, without success. I take pleasure in saying that I am indebted to the late Dr. E. G. Janeway for this method of procedure.

DR. McWILLIAMS: Local anesthesia is very difficult to employ, as one has to handle and compress the intestines considerably. Of course, nitrous oxid anesthesia is the best if it is available.

My subject was simply acute obstruction, and in such cases it is impossible to use the bismuth and X-ray method to locate the obstruction.

THE PRESENT STATUS OF CANCER.*

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TO those who have come here in anticipation of hearing something new on the subject of cancer, I must offer an apology. I have nothing new to bring before you regarding either the etiology, diagnosis, prognosis, or treatment of the disease per se. All things valuable in these relations must come from the experimental laboratory. The time is long since passed when even the most observant clinicians are at all liable to make any startling additions to our knowledge of this or other diseases. All the essential super-

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ficial and clinical facts have been discovered. It is only the laboratory worker who can go further. As a clinician, dealing with my share of these mournful cases, I am aware of certain facts, known to you all. If I can present them in a new or more impressive form than they have yet been presented, or if new combinations of old truths shall leave a deeper impression, I shall have accomplished all that I essay.

That frequent discussion of the question of cancer is vitally necessary is evidenced by its rapid increase and its appalling mortality. Some statisticians try to allay our fears and to give us comfort in the assumption that there is no real increase in the prevalence of cancer, that its apparent increase is due to better diagnosis and more complete mortuary records. Even if this be the correct view, the fact that most of our knowledge of these cases comes from the mortality records, that the word cancer and death are so nearly synonymous, is sufficient reason for unremitting study. But for one, I do not believe we can take comfort in these arguments. Figures from all parts of the world seem to indicate a real increase in the prevalence of the disease until it is assuming an importance second only to tuberculosis on the welfare of the race. According to Williams, in his "Natural History of Cancer," quoted by Pilcher, the death rate from cancer within recent years has more than doubled in New York City, Chicago and Philadelphia; it has more than trebled in Boston and Baltimore; it is five times more frequent in New Orleans and seven times more frequent in San Francisco. In the latter city it increased from 103.6 to 112 cases per 100,000 of population in the twelve years between 1888 and 1900. Roswell Park stated in 1910 that in New York State there are annually 8,000 deaths from cancer and 11,000 or 12,000 deaths from tuberculosis. In England, where the death rate from cancer has more than doubled in the past fifty years, there were, in 1909, 34,000 deaths from cancer as against 38,000 deaths from tuberculosis. Yet in the latter disease, we have a fighting force consisting of the profession, lay organizations, traveling exhibits, church meetings, stereopticon lectures, circulars or information, etc. In New York State cancer is the only disease tabulated which shows a progressive and steady increment. In Prussia, 9.3 per cent. of all persons passing the age of thirty, die of cancer. In Baden, Werner's investigation compelled him to admit an actual increase of the disease, although he holds that better diagnosis and more accurate records accounts in part for the increase. Bertillion's studies show a marked increase all over Europe. According to him, the disease has trebled in the past fifty years in Europe. He finds the disease most prevalent in the north of Europe, less in

the central countries and least in the Mediterranean States.

Similar figures could be quoted from all parts of the world, proving that cancer is rapidly becoming one of our greatest menaces. Is it necessary, therefore, to offer an apology for this subject until the rising tide is reversed? The fatal parallel between the figures representing the incidence and mortality of the disease should further spur us to continued action. Who of us can feel any security in discussing our cures of cancer? We are constantly in fear of recurrence in the most hopeful cases, but in the late cases, which predominate in all clinics, we can prognosticate with too great assurance their sad future. While we wait, hopeful that the laboratory will come to our aid, what can we do to reduce this fearful death rate?

I am an optimist in this direction. I believe that with our present knowledge rightly applied, these figures may be improved 50 per cent. or more. Hence, the object of this paper. Let me here quote L. S. Pilcher's vividly descriptive definition of cancer, from his article entitled, "The Cure of Cancer": "It is in the lawless proliferation of pre-existing epithelial cells in luxuriant, irregularly-arranged masses that invade underlying and surrounding tissues, permeating them, destroying them, and finally themselves attaining a mass which can no longer be adequately nourished by any accessible blood supply, and which itself then falls into central decay while at the periphery the process still goes on, that cancer consists." I wish also to touch briefly on the prevailing ideas of the cause of cancer, simply as an indication of the direction in which we are to look for a real cure or specific. At the present it may be said that two theories occupy attention. Cohnheim's theory supposes the persistence in adult life of germinal embryonic cells, or the reversion of fully developed cells to an embryonic type, which, under the influence of certain stimuli or conditions, take on a rapid, aberrant multiplication, the malignancy of the resulting growth being greater the nearer the cells approach the character of the original germ cells. This theory has many able supporters and has been modified by others, to meet their ideas. So far as I can see, its unqualified acceptance by the profession would leave us just where we are today as regards treatment. More promising in this direction is the parasitic theory. The developments of the past quarter of a century naturally incline scientists to look hopefully toward this solution of the mystery. Many interesting and important facts have been discovered in the research along this line, yet it must be confessed that its advocates have not proved their case and many of their observations may perhaps be explained on other grounds. Granted adequate proof of the para-

sitic nature of the disease, we might look hopefully for a curative or prophylactic serum as a sequence. Dr. Harvey R. Gaylord of the State Cancer Laboratory at Buffalo, one of the foremost workers in this field, has just succeeded in convincing the State Legislature that further progress demands a hospital for the care of patients, and an appropriation has been made for this purpose. He summarizes an extensive article in Bryant and Bucks' *Surgery*, recently published, as follows: (1) An analogy exists between certain of the changes in the epithelium in cancer and those occurring in the epithelium in certain of the acute exanthemata, notably variola, and sheep-pox, known infectious diseases. (2) The almost exclusive appearance of cancer of the breast in elderly female mice which have been used extensively for breeding is best explained by the transference of some infective material, through the medium of indiscriminate nursing, by the offspring (Erich). (3) Tumors in mice are almost never found alone. In breeding establishments, where one case appears it is always accompanied by others. Healthy mice, brought in contact with mice with primary tumors, acquire the same (Borrel). (4) The appearance of sarcoma of the rat in a cage which had contained rats inoculated with sarcoma points to the possibility of cage infection in this form of cancer. (5) A gradual transformation of normal epithelial cells into cancer cells occurs at the margins of primary cancers (Orth). (6) The continued transplantation of mouse tumors increases rather than reduces their virulence. Certain mouse tumors under transplantation have acquired a virulence only comparable to that of an acute infectious process. (7) A certain number of mice are shown to possess a natural immunity which prevents inoculation with cancer. Spontaneous retrogression of cancer in mice is accompanied by histological appearances which show that the epithelium is not primarily injured, but that the stimulating factor is removed. Spontaneous retrogression is accompanied by a type of acquired immunity which prevents the successful reinoculation of the animal, and under favorable conditions this factor appears to be present in the blood and behaves not unlike the known antitoxins to infectious processes. (8) The blood of spontaneously recovered mice, when added to cancer material before transplantation, removes from it the power of continued proliferation. There is no evidence of cytolytic action (Clowes). (9) Tumors retrograding under the influence of the X-ray and radium present exactly the histological picture of tumors spontaneously retrograding. The stimulating factor seems to be removed from the epithelium through the aid of the immune

mechanism. (10) The epithelial layer of cells of the deeper layers of warts, after successful treatment with the X-ray, no longer proliferate to form a new wart, but reproduce normal skin (Perthes), showing that the stimulus to proliferation has been removed and that there remain epithelial cells capable of normal proliferating function. (11) The unknown factor in cancer is apparently added to normal epithelium, from which it can be removed, leaving normal epithelium. Through the proliferation of the cells of the cancer, which must increase enormously, this factor must of necessity gradually increase in amount. The increase in bulk, through transplantation in mouse tumors, is associated with increased virulence. The only known agent which can fulfil these conditions is a living organism. The unknown factor may be an ultramicroscopic organism, or one that is simply undemonstrable.

This seems to me to be a convincing arraignment of facts that gives great promise for future results. Possibly as in tuberculosis, it may never lead to a specific, but with a definite cause assigned, the battle is half won. However, the clinician is facing a vast army—he must act now. He can not await the arrival of more definite knowledge but must bring to bear all the resources at his present command. Here is where we have been negligent. We have neglected to teach the public facts which they should know. Many of us have given only a half-hearted acquiescence to teachings that can not be disputed, that are of the utmost importance in the successful treatment of cancer. Remove these two obstacles and we can improve the present statistics fully 50 per cent. by the more effective use of the knowledge we already have.

Our only resource in cancer at present is extirpation by cautery or knife, usually the latter; early, thorough surgery. Our failures are largely due to late, incomplete operations. We must first thoroughly convince ourselves of the fact admitted by all as a general proposition that at some time in its evolution, cancer is a strictly local disturbance, infection, inclusion or whatnot. Having convinced ourselves of this truth, and its bearing on the curability of the disease is patent, we must be guided by it and it must be given publicity. The public must be instructed in this disease as in tuberculosis and the medical profession should be the first to take up the work. Literature should be placed in their hands, meetings should be held, their co-operation should be solicited. Cancer is perhaps a more difficult disease to fight than tuberculosis. The public will dread the treatment more than that for tuberculosis. But on the other hand they are more intelligent now, more open to suggestion, since they are witnessing the results of pub-

licity in tuberculosis. Publicity, no matter how difficult to accomplish or how unwelcome, must come, irrespective of what specific the future may hold.

Before all this, however, we must first set our own house in order. We have, in our ranks many doubters, many delinquents, many who apparently doubt the curability of the disease, even in its early, localized manifestations, many who disregard the importance of precancerous states. All of these contribute to the present high mortality rate of cancer and stand in the way of its greatest reduction by our present means. They must be converted, else we will continue to see advanced, unfavorable or inoperative types of the disease.

It is in the line of prophylaxis that we may perhaps accomplish most. William J. Mayo has contributed a valuable article on this subject, in which he calls attention to chronic local irritations which are frequent forerunners of cancer. I will mention a few of the most important of these. We know the special tendency for cancer to develop at the various ostia of the body, the mouth, lower end of the œsophagus, pylorus, ileocecal valve and rectum. Diseases in these locations, no matter how trivial in appearance, must not be neglected. Fissures, ulcers, all chronic inflammatory lesions in these locations, should receive timely treatment. McCarthy, pathologist at the Mayo clinic, has shown that $\frac{1}{2}$ per cent. of all appendices removed for chronic appendicitis are carcinomatous, another justification for the operative treatment of this condition. We have ample proof of the frequency of the malignant sequence of cholelithiasis and other chronic biliary infections. What stronger argument in favor of early operation in these cases? Young and others have demonstrated that about 20 per cent. of hypertrophied prostates are cancerous, yet at present we are advising operation only when they are causing urinary obstruction. Vesical papillomata and calculi furnish just the right sort of chronic irritation, admitted to be an important factor in the development of cancer. Why temporize with these cases? So too with lacerations of the cervix, uterine fibroids, benign neoplasms of the breast, hemorrhoids, varicose ulcers. Even though a new growth does not itself degenerate into a malignant one, its presence may excite malignant change in tissues adjacent to it. There are many other conditions which may end in malignant disease but the foregoing are sufficient for my purpose. If we give these conditions their full importance as causes of cancer and threat them accordingly, who can estimate the improvement in cancer statistics?

The importance of cell implantation during operation probably has much to do with recurrences. This has been recognized for many

years, but the majority of us have not given it its proper consideration. Clean, wide excision of tumors, careful handling, and the use of the cautery or such powerful antiseptics as Harrington's solution, are the most effective means of avoiding this accident. All diagnostic methods, such as the methylene-blue reaction in the urine, though unfortunately most of these appear too late to be of great value, should be accorded careful study and due consideration.

I believe, then, that if we accept as truths for practical application, not as merely interesting scientific facts, the localized nature of the disease in its early manifestations, the precancerous nature of many chronic inflammatory lesions, the reality of cell-implantation during operation, and that if the public are taught the danger of allowing any abnormality to long exist without consultation and that the diagnosis of cancer means immediate, thorough operation, just as at present the diagnosis of tuberculosis means fresh air, sunlight, rest and forced feeding, we will witness a marked improvement in our statistics as well as a marked decrease in the incidence of cancer.

ON THE ROLE OF EDUCATION IN THE PREVENTION OF INSANITY.*

By C. MACFIE CAMPBELL, M.D.,

WHITE PLAINS.

THE question of the prevention of insanity is one in the forefront of medical thought at the present time. The conception has not only aroused theoretical interest, but has inspired a definite movement and led to the organization of several bodies, which aim at taking practical steps to carry out this most desirable object. Education will play a cardinal rôle in any such movement. Our knowledge of mental diseases has many gaps, but one is impressed by the fact that we have a great deal of knowledge with regard to mental disorders, which is not being made use of. The practical application of our knowledge should go hand in hand with our research studies and should not lag far in the rear. In three directions the opportunities open to educational methods promise a good return.

Firstly, it is important that the community should learn certain important facts bearing on the causation of mental diseases, and should show the same attitude to mental disorders as to other forms of sickness, so that the conditions for the early treatment and the after care of the insane may be favorable.

Secondly, the general medical profession should have a much more alert attitude towards early symptoms of mental disorders, and should feel competent to deal with them in a purposeful and reasonable way, and the practitioner should

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not feel that the only knowledge required of him is what is sufficient to enable him to certify a patient.

Thirdly, apart from the education of the adult members of the community and of the members of the medical profession, responsible as it is for the hygiene of the community, one has to consider the great importance of education in its more usual meaning, the education of the developing individual.

With regard to the education of the community, I should like to call your attention to a pamphlet entitled, "Why Should Anyone Go Insane?" which has been circulated by the thousands throughout New York State in an endeavor to put directly before the laity certain important facts. Many facts of great hygienic importance can be readily appreciated by the intelligent layman. It is important that the general crusade against alcoholism and syphilis should be strengthened by the knowledge of the large number of cases of insanity due to chronic alcoholism, and of such startling facts as that one of every five male admissions to the metropolitan hospitals for the insane is a case of general paralysis, a disease essentially of syphilitic origin.

The general practitioner has a relation to his environment which enables him to be especially useful in disseminating such knowledge and in making it potent for good with regard to the hygiene of the community. His special knowledge may be utilized either in frank individual relations or by affiliation with, and inspiration of, movements, which would not have the same authority if carried on by a purely lay organization. As an illustration, the general practitioner may do a great deal of good, as an individual, in dispelling certain erroneous ideas which have a great deal to do with lax sexual morality. The glaring discrepancy between the conventional morality of our time and the actual mode of life of the average unmarried young man is partly accounted for by a current belief that chastity is in itself somewhat prejudicial to the health of the individual. Many a young man thinks that it is the natural thing to indulge his sexual instinct with prostitutes and others, not realizing that in gratifying an instinct that is one part of his nature, he is proving false to ethical cravings which are just as essential and just as healthy a part of his nature.

Apart from the dissemination of such knowledge, the general practitioner has in his more technical work many opportunities, which at present are probably insufficiently utilized, and the responsibility for this omission rests with his medical education.

Before a patient is sent to a hospital for treatment the family physician has usually been called in and frequently the patient has been under medical care at home for a long period. This stage is one of the most hopeful periods

from the point of view of treatment, and is the time at which it is most important to be in close touch with the actual forces which are threatening to disrupt the mental health of the patient. The symptoms are usually commonplace; somatic complaints of various nature are apt to be prominent; the patient's general activity may be somewhat abnormal; the usual interest in the ordinary matters of the patient's life is apt to flag, the patient may show an unusual interest in subjects which seem rather bizarre. Vague terms, such as neurasthenia, are apt to satisfy the physician's curiosity with regard to the nature of the case.

It is to be hoped that medical men will soon realize the responsibility which devolves upon them in this period and will not be satisfied with merely giving drugs for the headaches and sleeplessness, or prescribing tonics or cathartics on more or less general principles, or suggesting a rest cure or a voyage, trusting that the whole matter will readjust itself spontaneously. With a better education the physician will endeavor to understand the exact meaning and source of each individual symptom and will not rest content with the superficial explanation which the patient is always ready to offer or eager to accept. He will then find out that he is dealing, not with purely casual and capricious symptoms which he is to treat in a merely empirical way, but with symptoms full of meaning, which are the first warning of a dangerous break in the equilibrium of the forces which regulate the patient's conduct, and he will have to deal with these forces in a clear and purposeful way.

It is astonishing what an amount of benefit a patient, who is suffering from apparently a pronounced disorder, may derive from one or two frank interviews with a physician sufficiently aware of the springs of human conduct, quick to see where the shoe pinches, and willing to help the patient to deal frankly with the real sources of his troubles.

The third direction in which we are now ready to make progress is that of education in the more usual sense, the training of the developing child. It is somewhat dangerous to touch on this topic, for even to emphasize the facts is often interpreted as implying a suggested solution of the problem. Whoever realizes the complexity of the situation must be well aware of the difficulty of offering a solution, with the existing diversity of opinion on these topics. It must be insisted on, however, that the time is ripe for certain conditions to be definitely brought up for discussion with a view to practical decisions being arrived at: for in many mental disorders we see the culmination of a process, which was profoundly influenced by the early environment and the educational influences, which helped to form the developing individual. The situation here is too complex for the layman to thoroughly realize, and requires a certain intellectual level to be

appreciated. On the other hand, the thought is intolerable that we should simply accept the situation without doing something to modify the factors which tend to produce such disastrous results.

When it is a question of dealing with mental constitution, family atmosphere, educational methods, social and ethical influences, from what center shall we direct our prophylaxis? To what authorities can we appeal? By what means can the facts which we actually possess be made of some use for the health of the community? If important facts cannot be directly placed before the community, they must filter down through the various educational channels and the source from which these influences flow should be the universities or other educational centers. The psychiatrist must bring to the psychologist the data of the consulting room, so different from those of the psychological laboratory. These data must not be neglected when the psychologist places before the teachers the facts which are to guide them in their educational work. As yet we have made scarcely a beginning in this co-operative labor; teachers are only beginning to realize the full scope of the problem with which they have to deal.

In discussing the education of the child from the point of view of mental hygiene and the prevention of mental disorder, one must take education in the widest sense; it should mean more than the equipping the individual with a certain amount of knowledge, commercial or ornamental. It should mean the process of fitting the individual to harmoniously adjust himself to his environment in a biologically healthy way. The education of the child begins not when it first enters the kindergarten but when it is put to its mother's breast. Traits of character are not fixed elements lying immutable in the center of the personality. They are types of reactions and habits of activity which develop from elements intimately associated with the instinctive life of the individual.

It is not for the psychiatrist to pass from his own sphere into that of the pedagogue unless he has had special training. The psychiatrist, however, has a right and a duty to insist that the facts with which he is confronted in his daily work be made available to those who are dealing with the developing child.

We believe that many patients, who come under observation with well-marked mental disorders, would have benefited by special advice and guidance in the years of their development; advice which they received neither from their parents nor their teachers, their physicians nor their pastors. It seemed to be the direct duty of none of these to supply the guidance which was of supreme importance and the want of which was an important condition of the later development of morbid symptoms. Looking back on the development of a case it seems that much might

have been done in the way of prophylaxis, but a prophylaxis which would take in wider considerations than those usually included under medicine proper. The solution of the problem passes into a region where the co-operation of the teacher, of the psychologist, of the physician, of the social and religious worker and of all those, who are responsible for the moulding of public opinion, is required. We are beginning to see in outline the steps in the development of many disorders and to apportion in a tentative manner its due weight to each causal factor, to the type of constitution of the individual, to the family environment, the education received, the social and religious influences which bore upon the patient, the various upsetting factors and conflicts that formed part of that individual's life. From our study of mental disorders we are learning that the daily routine of the infant and the young child with regard to the elementary functions of nutrition, defæcation and micturition contains elements of great importance, any abnormality of which should receive serious consideration.

In the psychoneuroses and in other mental disorders we come across odd delusions and reactions which only receive their interpretation when we understand them in the light of infantile tendencies, which have later been repressed and put out of sight but not quite eliminated from the individual's life. The early affective life of the child in relation to father and mother, brother and sister, contains in it germs which are later to be subtly interwoven with the sexual life of the adolescent and the adult. As the infant develops into the child, the child into the adolescent, the groping for somatic satisfaction may lead the individual into aberrant paths; these aberrant paths are ancestral residuals which we all bear within us, and may be compared to the vermiform appendix, a fruitful source of trouble.

The child, with its affective life aroused by the caresses of the members of its own family, finds these the first objects of its satisfaction long before the social conception of incest has any meaning for it. The sexual life which later becomes more definitely localized and specific may find channels for its outlet already determined in part by these early influences. The more specific manifestations of the sexual instinct are worthy of close attention, a fact which has hitherto only been partially recognized in the importance which most have been willing to attribute to masturbation. The actual meaning of that aberrant manifestation in the individual case, however, may vary considerably and it is of the greatest importance that the symptoms should be treated with full cognizance of the part which it plays in the whole life of the child. It is quite inadequate to try to correct these tendencies merely by the weight of an external

authority or by appealing to other somewhat inferior motives.

Natural tendencies which assert themselves in this way can probably only be satisfactorily dealt with when the child is helped to a clearer appreciation of the actual bearing of these new factors which are entering into his life. To be taught that they are absolutely mysterious, in themselves unworthy, something merely to be crushed and ignored, is not sufficient when the recurrent cravings are sufficient proof that they are an integral part of one's nature, and when they refuse to be disowned. Is there any objection to the child being somewhat early initiated into some sense of the responsibility attached to functions which are going to be dominant factors in his adult life? Would it not be wiser to teach the developing individual the value of the sexual life rather than emphasize its humble origin? The importance of early ruminations on this topic, the influence of the oppressive feeling of mystery which surrounds it, with the consequent impairment of frank and healthy relations with comrades, is a fact which the physician often comes across and which the teacher well knows, but which has probably not received sufficient weight in educational discussions; thus we are at present at a loss for definite educational methods based upon the above facts, and we are not even agreed upon the principles which shall guide us. The divergence as to principles largely depends upon the fact that the knowledge of the forces in human life gained by an analysis of mental disorders is as yet restricted to a comparatively small body of workers in this field. The dissemination of this knowledge meets considerable resistance and the presentation of the subject is very apt to be misunderstood. It is to be hoped, however, that the spread of this knowledge among psychologists, teachers, and physicians will create an educational atmosphere in which the child of psychoneurotic constitution will have a better chance of keeping his equilibrium. Progress in this respect cannot be very rapid, the results will be difficult to estimate, but in working towards the establishment of such principles, the psychiatrist is laying the foundation of a wide prophylactic movement.

Discussion.

MR. EVERETT S. ELWOOD, Assistant Secretary, State Charities Aid Association, New York: It is with great appreciation that I have listened to this paper, and, of course, feel that I have little to add. It is a source of much encouragement to note Dr. Campbell's confidence in the value of popular education as a prophylactic measure. Such education should be as thorough as it can possibly be made. We should not be satisfied with simply placing this information before the people once—we should place it before them over and over again and in many different forms. It will require much popular education to counteract the injurious effects of the

practices and extensive advertisements of the medical quack.

As I review my six years of teaching experience, I see greater possibilities for more effectively training a certain type of pupil than I did while actively engaged in the work. I am not prone to criticise our educational system, for I fully appreciate the great things it is accomplishing. From my recent and as yet limited knowledge of the causes of insanity, I believe that more can be done in our public schools than is done at the present time in educating the young in the prevention of mental disorders. I recall many individual cases among my former school children that I should now handle much differently than I did then. I should take many nervous, over-anxious, or brooding pupils directly to an alienist for examination and treatment, instead of spending time and energy in mistaken kindness endeavoring to encourage them in their studies. I should also be inclined to give such children more of industrial training and less of the severe mental strain which they must undergo in following the prescribed course of our public schools.

The Committee on Mental Hygiene in its work for the prevention of insanity, is depending upon the physicians for advice, direction and leadership. Much more might be done by the general practitioner if he had an opportunity to gain more definite knowledge of the causes and nature of insanity during his medical studies. If the physicians throughout the State possessed a thorough knowledge of the causes of insanity, they would be of very great assistance in advancing popular education, for the public always gives attention to medical information coming from a physician.

vention of disease by the medical profession as shown by this program of the annual convention is one of the most encouraging signs of the times. I sometimes wonder what would happen to this country if the legal profession did as much to prevent crime and useless litigation, or did as much to hasten the administration of justice, as the medical profession is doing for the prevention of disease and the preservation of public health.

We are looking to the profession for guidance and direction in this work. As laymen we stand ready to support it in all undertakings making for the prevention of disease.

RESPONSIBILITY OF THE COUNTRY PRACTITIONER IN RELATION TO PUBLIC HEALTH.*

By ELLIOT T. BUSH, M.D.,
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UNTIL specialization in medicine and preventative medicine progresses to the point of producing the health officer as a specialist, and the people are educated to the eco-

* Read at the Annual Meeting of the Sixth District Branch, at Elmira, October 17, 1911.

nomical value of maintaining such an expert for the advancement of public health and the supervision of preventable diseases, the burden or responsibility to that end, particularly in the rural districts, must lie on the general practitioner or family physician.

The duties of the present specialist are integral. He makes his diagnosis, administers treatment, makes his records, collects his fees, reads his papers before medical meetings (a substitute for the more unethical newspaper advertising), lives an easy, though busy life. Those of the family physician are composite. In addition to his duties and responsibilities as diagnostician and therapist, he is graced with the more serious, and oftentimes more conscience racking responsibilities of advisor to his clients and the community. The dictator to his families, of the physical mechanism of the child from the cradle, through school to motherhood and fatherhood and often to the grave of the senile. He is also many times the adjuster of irregularities pertaining as much to the happiness as to the health of his clients. Thus he stands in the peculiar position of one who gets his bread and butter from the ills of the people, and too, from his ability to administer to such is singularly qualified to prevent them and cut off his income.

The state expects its share of assistance from the individual physician, compelling him to take particular attention toward the prevention of ophthalmia in infants, and to report cases and co-operate in the isolation and prevention of communicable diseases. It goes farther and makes an official of one man in each town or village, who has the supervision of such precautionary measures, and is clothed with the authority of the state and backed by stringent laws upholding him in his actions. While this system is productive of good results it is plain that the ideal of efficiency would be more nearly reached were such duties not in the hands of one whose maintainance depends partly on his popularity. It is often more safe to call a man a liar than to tell him he is unclean. Were all physicians on an equal basis, regarding energy and sincerity, it would seem that to clothe each physician with the responsibility and authority of a health officer would incite more interest and thus be more effective and less productive of ill feeling.

That the country physician has a public health duty, particularly in the rural localities, is evidenced by the fact that the decrease of communicable diseases, particularly typhoid and tuberculosis is less noticeable in the country than in the cities. This can plainly be accounted for by the fact that the campaign of education in the cities and the benefits of trained health officers do not reach the rural population. Through ignorance and lack of supervision, buildings, wells, drainage, etc., are installed or allowed to obtain, which would not be tolerated in the cities. It has been my experience to attend as many typhoid cases

in a hamlet of two hundred or less population in one year as there were native cases reported in this city in the same length of time, without the least apparent apprehension by the health officer and with absolute disregard to sanitary precautions advised by the attendant. It is a significant fact that when a typhoid case appears in your city your inquiries to ascertain the origin begin with the investigation whether or not your patient has recently been sojourning in the country. It is a sad fact that the inhabitants of the country, where fresh air is so free and plentiful that its value is not realized, it is safe to say that the majority of such inhabitants, equal to or above the average intelligence, sleep in stuffier bed rooms and live in more ill-ventilated living rooms than many of the ignorant tenement city dwellers, and that the warnings of the dangers of contamination from tubercular patients are pooh hooded, to the point of exasperation, and except in instances where the element of fear of bodily harm prevails, quarantine is shamefully disregarded. Thus it is true that the country physician has as a duty a mountain of ignorance to overcome.

Further than this compulsory duty as the community's only intelligent educator in the line of preventing diseases, the family physician is compelled by conscience in a great many ways to keep the pathway of his patients' life easy of travel and free from the stones and ruts of disease. It should be his duty to advise the parent in many instances in which his advice is not sought, for the reason that the parent or nurse may not be cognizant of the facts that there are precautionary measures to be taken or that they may deem themselves capable of judging things which their education does not qualify them to judge. The doctor should volunteer his information, having at heart the welfare of the child or patient. Should such voluntary information not be received in the spirit in which it is given, the physician should not resent the ingratitude, but feel that his duty is done and if his advice is not followed the responsibility of poor results does not rest on his shoulders. A few of these may be mentioned.

If the infant, by chance, is handicapped by the necessity of growing out of his infancy on artificial food, it is the physician's duty to point out a way of getting and properly preserving cow's milk. The cities have their certified milk, and regulations which insure its cleanliness to the buyers. In the country this is not so and it is my experience to find more intestinal disorders from impure milk among children of, and nearby the dairy farms than in the more thickly populated districts, whose milk supply is under municipal control.

He should guard the school child from the evil effects of a good but oftentimes abused compulsory educational law. There are beyond doubt, children kept, from fear of the authorities, in school.

who from physical or nervous defects have no right to be there and are receiving nothing but physical harm and mental discouragement by their presence. Others by unusual precocity are driven by their over-zealous teachers into inevitable nervous ruin and mental incapacity. Still others, apparent laggards, should be protected from the evil effects of indifference on the part of teacher and parent, for often the repeater or dullard in school turns out to be a prodigy in later life. The benefits of school medical inspection, which prevail in larger communities should be allowed the rural pupil who often from lack of resources is stunted in proper grade instruction and should not be handicapped by preventable physical defects.

By virtue of his greater acquaintance with worldly affairs and the position he holds of viewing a young man's qualities in the abstract, the physician is not overstepping his position in directing the youth to a proper calling. When physical conditions should not permit violent or the usual school-boy exercises, he should be warned of the ill effects of such and a proper line of pleasurable sports be laid out.

By the same virtue, the knowledge he has of a youth's temperament, as possible nervous or physical taints and hereditary influences and the likelihood of a union bringing forth defective progeny, until there are laws to prevent such, he is morally obligated to judiciously discourage such a union. Again, until false modesty, pseudo delicacy, and the many unreasonable barriers to the plan of compulsion in reporting and isolating venereal cases, the physician, I believe, is licensed to use the most strenuous arguments and paint the blackest pictures to instill the fear of these infections.

Modern diagnostic methods in determining blood pressure and the early or timely onset of senile changes, places the physician frequently in a position to anticipate these tissue changes, and advices as to mode of living, diet and preventative measures should, when possible, be forthcoming without frequently too late solicitation of the patient.

The great white plague has, in the past few years, met with effective resistance and the recent agitation toward the elimination of this pest is already productive of a considerable diminution in the number of cases and deaths. It is in the prevention of this disease wherein lies one of the greatest of the moral duties of the family physician. Both to the public and the community, the recognition of the disease in its incipency is the only ideal ultimate means of prevention. Early discovery gives the patient the only chance of recovery and the advanced cases are the most dangerous to the community. It is a fact that the average practitioner in many instances is incompetent or indifferent to the importance of the earlier diagnosis of incipient pulmonary tuberculosis. It has been my experience, in several instances, to hear of a positive diagnosis, reached

by careful and thorough methods by one physician, refuted by others without even an examination, and with consequent evil results to the patient. In one instance, not only the patient died, but the disease was also contracted by and caused the death of the patient's sister. This is but one of many instances where professional inharmony and egotism works deleteriously to the benefit of the community. In the family of a tubercular individual the physician should go even further and should not only instruct toward the prevention, but should be constantly on the watch for the appearance of new cases in the family, advising, or if possible compelling, them to undergo frequent examinations, particularly on the appearance of loss of weight, anæmia, dyspepsia, amenorrhœa, or other signs of the so-called pre-tuberculous state.

One word as to our duty to the profession. The maximum of efficiency to the public and ourselves depends upon the maintainance of a high professional standard. It is deplorable that in a profession elevated to the extent that its members are willing to sacrifice the time and enjoyment which they do, loopholes of entrance are permitted by lax, though improving, legislative methods, for the imposter and the quack, and that absence of uniform, stringent requirements allows the profession to become so crowded that the commercial evil is contracted through the necessity to keep the wolf from the door and that apparent trivial signs of inharmony and slight expressions of feeling toward such quacks and imposters should be exaggerated by a public which is not yet educated beyond the point of sympathizing with these imaginary parasitic martyrs. We know that misgivings and faults reap more criticism than virtues do commendation and it is not without the province of an ethical physician to blow his horn, if not for himself personally, for the professional in general, reminding the always ungrateful public of the accomplishments of the leaders, such as Jenner, and Pasteur, who by their discoveries, have saved millions of lives, and from an economical standpoint, billions of dollars; who today are putting in the shadow the accomplishments in the building of dreadnoughts by the institutions of super-dreadnoughts of defense by means of methods of prevention of diseases which in military encounters treble the decimating effect of destructive implements. That to remove the influence of such modest workers, who work more for the good of the public than for lust of the almighty dollar, man's expectancy, which has increased so rapidly in the past few years in spite of the concentration of population, would drop so quickly as to cause that honorable executive to repent his remarks anent the "Doctors' Trust," when importuned to install a National Department of Health, a trust, which if it used the methods in its hands for public harm, which it does for public good, would be burned in a body at the stake without the customary dignifying investigation.

CORRESPONDENCE.

To the Editor of New York State Journal of Medicine.

SIR: I should be very sorry to think that any words of mine had been misinterpreted, or caused the quacks to rejoice, as I believe "good men and true" have "qualms;" quacks none.

I agree thoroughly with Dr. Charles Haase, of Elmira, that "when we perform conscientious and thorough work, our patients who are able should pay us a just fee."

On the other hand, and from the point of view of what, to me, is highest and best, work of the physician in this world, should be done irrespective of pecuniary reward. Of course, I understand, as well as anyone, that very few physicians are independent of their professional income and have house rent to pay and often families to support.

Nevertheless, I regret it is so, as I regret any preacher of Christ's gospel is compelled to get a salary from his parishioners.

BEVERLEY ROBINSON.

September 20, 1912.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

THE PRACTITIONER'S ENCYCLOPÆDIA of Medicine and Surgery in all their Branches. Edited by J. Keogh Murphy, M.C. (Cantab), F.R.C.S., Surgeon, Miller General Hospital for Southeast London; Senior Assistant Surgeon to Paddington Green Children's Hospital, London. Henry Frowde. Oxford University Press. Hodder & Stoughton, Warwick Square, E. C. 1912. Price in cloth binding, \$7.00; half leather, \$8.00.

PRINCIPLES OF HUMAN PHYSIOLOGY. By Ernest H. Starling, M.D. (Lond.), F.R.C.P., F.R.S., Hon. M.D. (Breslau), Jodrell Professor of Physiology in University College, London. Lea & Febiger, Philadelphia and New York. 1912.

ELEMENTARY BACTERIOLOGY AND PROTOZOLOGY. The Microbiological Causes of the Infectious Diseases. By Herbert Fox, M.D., Director of the William Pepper Laboratory of Clinical Medicine in the University of Pennsylvania; Pathologist to the Zoological Society of Philadelphia, etc. Illustrated with 67 engravings and 5 colored plates. Lea & Febiger. Philadelphia and New York. 1912.

INTERNATIONAL CLINICS. A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, orthopædics, pathology, dermatology, ophthalmology, otology, rhinology, laryngology, hygiene, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, U. S. A., with the collaboration of John A. Witherpoon, M.D., Nashville, Tenn., Wm. Osler, M.D., Oxford, A. McPhedran, M.D., Toronto, Frank Billings, M.D., Chicago, Chas. H. Mayo, M.D., Rochester, Thos. H. Rotch, M.D., Boston, John G. Clark, M.D., Philadelphia, James J. Walsh, M.D., New York, J. W. Ballantyne, M.D., Edinburgh, John Harold, M.D., London, Richard Kretz, M.D., Vienna. With regular correspondents in Montreal, London, Paris, Berlin, Vienna, Leipsic, Brussels and Carsbad. Volume III, Twenty-second Series, 1912. Philadelphia and

London. J. B. Lippincott Company. 1912. Price, \$2.00.

A TREATISE ON DISEASES OF THE HAIR. By George Thomas Jackson, M.D., Professor of Dermatology in the College of Physicians and Surgeons, Medical Department of Columbia University, and Charles Wood McMurtry, M.D., Instructor in Dermatology in the College of Physicians and Surgeons, Medical Department of Columbia University, New York. Octavo, 366 pages, with 109 engravings and 10 colored plates. Lea & Febiger. Philadelphia and New York. 1912. Cloth, \$3.75 net.

MENTAL DERANGEMENTS IN INDIA. Their Symptoms and Treatment. Being a handbook to the theory and practice of mental disease in India together with notes dealing with the legal aspect of insanity and the various questions likely to arise concerning it. By A. W. Overbeck-Wright, M.B., Ch.B., Med. Psych. Cert., D.P.H. Captain, Indian Medical Service. Calcutta and Simla. Thacker, Spink & Co. 1912.

A MANUAL OF CHEMISTRY. A Guide to Lectures and Laboratory Work for Beginners in Chemistry. A text-book specially adapted for Students of Medicine, Pharmacy and Dentistry. By W. Simon, Ph.D., M.D., Professor of Chemistry in the College of Physicians and Surgeons, Baltimore, and in the Baltimore College of Dental Surgery; Emeritus Professor in the Maryland College of Pharmacy; and Daniel Base, Ph.D., Professor of Chemistry in the University of Maryland. New (10th) edition, enlarged and thoroughly revised. Octavo, 774 pages, with 82 engravings and 9 colored plates, illustrating 64 of the most important chemical tests. Lea & Febiger. Philadelphia and New York. 1912. Cloth, \$3.00 net.

SURGERY OF THE RECTUM, FOR PRACTITIONERS. By Sir Frederick Wallis, M.B., B. C. (Cantab), F. R. C. S., Surgeon to Charing Cross Hospital, St. Mark's Hospital and the Grosvenor Hospital for Women and Children, London. Henry Frowde. Oxford University Press. Hodder & Stoughton, Warwick Square, E. C. 1912.

CONSUMPTION IN GENERAL PRACTICE. By H. Hyslop Thomson, M.D., D.P.H., Medical Superintendent, Liverpool Sanatorium. Henry Frowde. Oxford University Press. Hodder & Stoughton, Warwick Square, E. C. 1912.

MAKING GOOD ON PRIVATE DUTY. Practical Hints to Graduate Nurses. By Harriet Camp Lounsbury, R.N., President West Virginia State Nurses' Association; Sanitary School Inspector for Charleston Independent School District. J. B. Lippincott Company. Philadelphia and London.

DEATHS.

GEORGE H. COCKS, M.D., New York City, died September 8, 1912.

JOHN LAWRENCE HUGHES, M.D., Mt. Vernon, died September 21, 1912.

JAMES EDWARD NEWCOMB, M.D., New York City, died August 27, 1912.

FRANK JUDSON PARKER, M.D., New York City, died October 2, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

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EDITORIAL DEPARTMENT

ANTI-TYPHOID VACCINATION.

THE successful prevention of typhoid fever by means of bacterial vaccines now ranks among the highest achievements of preventive medicine. This achievement stands, with the discoveries of smallpox vaccination and diphtheria antitoxin, as one of the greatest benefits yet conferred upon mankind by the genius of the laboratory worker. In spite of polluted water, milk or food supplies, in spite of infection-dealing carriers and of the disease-carrying fly, we have at hand an agent which halts this dreaded scourge at the human threshold. Typhoid fever is preventable, and, being preventable, it can be eliminated from the category of human infections.

Anti-typhoid vaccination is not new. Wright, developing a suggestion from Pfeiffer, prepared a vaccine from the typhoid bacillus and practised vaccination on a large number of British troops engaged in the Anglo-South African war. The true value of this procedure was, unfortunately, obscured in the controversial interpretations given the statistical data. Its value was sufficiently established, however, to encourage others to continue the work. To Major F. F. Russell of the United States Army should be given high credit for the systematic and thorough means in which he has developed the practice of anti-typhoid vaccination. Through the compulsory vaccination of soldiers and sailors he has obtained data which, by their number and nature, prove conclusively the efficiency of the method. From all sides come confirmatory re-

ports. Institutional inmates and attendants are now completely protected; physicians and nurses, although exposed to infection in the performance of their duties, need no longer suffer infection. This protection should be extended to all, and doubtless this can be better accomplished by an educational campaign rather than by any compulsory measure.

The details of the immunization admit of modification which may result in greater efficiency. Wright employed a bouillon culture of typhoid which had been devitalized by heat. The vaccine used by Russell is a dilute emulsion in salt solution of typhoid bacilli from agar cultures in which the bacilli have been killed by the least heat exposure necessary to kill the organisms. From a biologic standpoint the potency of a vaccine depends upon the degree to which the natural biologic integrity of the bacterial protein has been preserved. It is therefore desirable in the preparation of a vaccine, in depriving them of their ability to multiply or infect, to submit the bacterial bodies to the least possible chemical or physical mutilation. With this consideration in view, Castellani submits his cultures to 50 degrees C. for one half hour, which attenuates but does not kill. Semple and Matson now show that complete sterility and high immunizing power is secured by the mere addition to the living culture of carbolic acid to 0.5 per cent. Vincent, in France, allows the bacilli to autolyze in salt solution and then sterilizes the emulsion by means of ether.

The recent work of Metchnikoff and Besredka

of the Pasteur Institute affords us a new means for studying typhoid fever. By feeding apes with the dejecta of typhoid patients they succeeded in transmitting typhoid fever to them and for the first time have been able to demonstrate the susceptibility of any animal other than man to a typical typhoid infection. Given a susceptible animal, it is now possible to study preventive and curative agents in a way which is impossible with the human subject. Metchnikoff and his co-workers have found that the subcutaneous injection of living typhoid bacilli of low virulence induces a high degree of protection against subsequent infection. By "sensitizing" the bacilli—that is, by treating them with the serum of an animal immunized against typhoid bacilli—they have been able to elicit a still greater immunizing response in the apes than by any other form of vaccine. The method, although seemingly radical, is merely an application of the classic experiments of Pasteur, who protected animals against anthrax by the injection of attenuated living anthrax bacilli. We have a natural hesitancy in introducing live micro-organisms into the human body. Before we can afford to lay aside this conservatism, we must be in the possession of more conclusive data as to the harmlessness of the procedure and of its efficiency in the human subject. Metchnikoff's experiments hold out a promise of progress, but whether or not the promise is fulfilled, we have in Russell's method of prophylactic vaccination a powerful agent for preventing and ultimately eliminating this microbial disease.

BENJAMIN WHITE.

AGGRESSINS.

IN 1902, Welch formulated the hypothesis that if the cells of multicellular organisms coming in contact with bacteria or their products produce antibodies which are inimical to bacteria, we have a right to assume that bacteria, also being living cells, may in turn be stimulated by the body cells and their products to produce antibodies which are inimical to the tissue cell. Looked at from the point of view of the bacteria as well as from that of the animal host, according to the hypothesis advanced, the struggle between the bacteria and the body cells in infections may be conceived as an immunizing contest in which each participant is stimulated by its opponent to the production of cytotoxins hostile to the other, and thereby endeavors to make itself immune against its antagonist.

In 1905, Bail actually demonstrated experimentally the truth of Welch's hypothesis by the following experiment: He injected animals intraperitoneally with the organisms of cholera, typhoid, tuberculosis, etc., and the exudate obtained was freed from bacteria by centrifugalization, and subsequently by chemical or by thermal (at 44 degrees C.) sterilization, of the supernatant fluid. This fluid combined with a

sublethal dose of the homologous organism, when injected into animals rapidly produces fatal results. From this experiment it is inferred that the injected fluid contained substances which served in paralyzing the onslaught of phagocytic and other protective agencies, and had thus made it possible for the bacteria to gain a foothold and to proliferate. Phagocytosis was absent. These substances Bail named "aggressins." Furthermore, animals can be actively immunized with this fluid and will resist death, if subsequently injected with lethal doses of the homologous organism. Animals so treated showed marked phagocytosis and were not only immune themselves, but contained a substance in their serum which permitted the passive immunization of other untreated animals. Bail explained this by assuming the production of antiaggressins in the treated subjects. The existence of these aggressins very probably explains certain observations of Wright, Douglas, Reid and Opie, namely, that exudates produced by the local growth of a given pathogenic microbe contain no opsonins. It may be stated more correctly, however, that under these conditions there is not an absence of opsonins, but a neutralization of the same by the bacterial aggressins. Depending whether a micro-organism is capable of producing an aggressin, and consequently of invading the animal body, bacteria may be divided into "pure parasites," "half parasites" and "saprophytes."

As was first shown by the work of Von Wasserman and Citron, "artificial aggressins" can be obtained from almost all pathogenic bacteria grown in the test tube. In work done by the writer this summer in conjunction with Citron, we were able to demonstrate by means of the complement deviation test that patients can be very highly immunized with these "artificial aggressins" against its homologous pathogenic micro-organism.

There is a decided advantage in immunizing with "artificial aggressins" as compared with that of dead bacteria or vaccines, in that you do not injure by exposure to that degree of temperature the immune producing substance, which is necessary to kill bacteria before they can be injected. There is also an absence of certain toxic substances found in the dead bacterial body and which is injurious to the tissue cells. Furthermore, vaccinating with aggressins is harmless; there is an absence or very mild local and general reaction. The immunity produced is strong and lasting; one can procure an immunity with it against the most virulent parasite.

In conclusion, we must bear in mind that the aggressin is to the micro-organism what the opsonin is to the animal; that the most virulent pathogenic bacteria, when robbed of their aggressins by the antiaggressins of the body cells, become mere saprophytes, an easy prey to phagocytosis.

WILLIAM LINTZ.

Original Articles.

THE RESULTS OBTAINED WITH ANTI-TYPHOID VACCINE IN THE ARMY TO THE END OF 1911.*

By FREDERICK F. RUSSELL, M.D.,

Major, Medical Corps, U. S. Army.

IT is unnecessary before this assemblage to dwell on the importance of typhoid fever, either in civil life or in the Army. The disease is the same wherever found and our medical problems in the Army are the same one encounters in preventive medicine in any community, yet their magnitude lends to them a certain amount of interest. Probably every physician here remembers the astonishment of the country and the chagrin of the medical profession at the terrific epidemic of this disease which swept through the mobilization camps in 1898. At the conclusion of the Spanish War a board consisting of Reed, Vaughan and Shakespeare investigated the prevalence of typhoid and concluded that most of it was due to contact infection, a small amount, about fifteen per cent., to flies, and toward the end of the summer, to infected water. The most important finding of the board was that so much disease was due to contact infection and so little to contaminated water. It is this conception of typhoid fever as a contagious disease which leads logically to the use of antityphoid vaccine, as the only method by which contact infection can be prevented.

The following table shows graphically the course of typhoid fever in the Army from 1897 to 1911:

Before the Spanish War the death rate was 33 per 100,000, practically the same as in the registration area of the United States for that period. In 1898 and 1899 the rate rose tremendously as a result of the changed conditions of the Spanish War and the sudden expansion of the Army. The regular army in 1898 consisted of 26,000 men and to this excellent, though small, nucleus was suddenly added 180,000 volunteers, all anxious to learn, but as yet untaught. The greater number of these men were discharged in April, 1899, and the army was reorganized on a new and larger basis in 1901, since which time improvement has been continuous. Special attention was always given the typhoid problem, and as the chart shows, both the admission and death rates have fallen steadily.

It is, however, one thing to keep a well-trained army free from typhoid in times of peace and quite another to control the disease in the event of a possible future war; the small regular army would again be overwhelmed with a large force of volunteers, full of enthusiasm, bright and in-

telligent, needing but little time to learn the ways of a sanitary camp. But in this short interval typhoid would surely again become epidemic and the history of 1898, more or less modified, would be repeated. It was this possibility rather than the amount of typhoid occurring in the service at this time which urged us on to the present campaign.

In 1896 and 1897, Pfeiffer and Kolle in Germany and Wright in England showed the practicability and the scientific soundness of prophylactic immunization by means of bacterial vaccines. The method had been used on a large scale in India by Wright and again in South Africa during the South African War. The Germans used it in Africa in their campaigns against the Hereros. In 1906-07 Leishman, who succeeded Wright in the British Army Medical College, reported remarkable results obtained in India with an improved vaccine, and after Wright's visit to the United States in 1907 we became much interested in Wright and his work with opsonins and vaccins. This is not the time for a discussion of vaccine therapy, but of all the prospects held out by Wright the possibility of preventing typhoid fever was the most attractive.

General O'Reilly, at that time surgeon general of our army, took an active interest in the work of Wright and Leishman and arranged for me to take up the subject at our school in Washington. Some work was done in 1907, but because of many other duties little advance was made prior to 1908; in that year much preliminary work was done and a laboratory arranged for the sole manufacture of typhoid vaccine. Early in 1910 we prepared 75,843 c.c. of vaccine and inoculated 16,073 persons. In 1911 we prepared 312,101 c.c. of vaccine and inoculated approximately 80,000 persons, most of whom belonged to the army.

In all, we have vaccinated approximately 100,000 persons; the navy, using vaccine prepared in our laboratory, has vaccinated approximately 50,000 more; the greater number received the full course of three doses.

The prophylactic vaccine used in the army, and up to the present time in the navy also, has been prepared at the army medical school. Only one strain of the bacillus, an old avirulent culture, has been used, although many other cultures, both new and old, have from time to time been tested out on rabbits, yet no culture with equal power of producing agglutinins has been found.

Austrian, in a recent paper upon the ophtalmo-reaction in typhoid fever (Bull. Johns Hopkins Hospital, Baltimore, 1912, XXIII. 1), calls attention to Durham's theory of relapses (Durham, J. Path. & Bacteriol. 1901, VII., 240). Durham believes that any given infection is "not the result of the action of a number of identical infecting individuals, but the result of the action of the sum of a number of infecting agents,

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

each of which is similar but not identical in nature." It follows that he explains relapses as infections by a different variety of the same species of organism, and there is some theoretical basis for this. Practically, however, there cannot be any great variety among typhoid bacilli since the vaccine used both by the English and ourselves is made from a single strain of the bacillus, yet it protects against infection wherever used, in all quarters of the globe.

The preparation of the vaccine, while theoretically simple, requires perfect technique, and our ability to turn out over a hundred thousand doses per month has not been acquired without considerable thought and careful planning. The bacillus is grown on agar in Kolle flasks for twenty-four hours, the growth is washed off in salt solution, killed at 55 degrees C. for one hour, standardized by counting the bacilli according to Wright's method, and finally diluted with salt solution until each cubic centimeter contains a billion bacilli; one-quarter of one per cent. of tricresol is added to the completed vaccine as a matter of safety. It is distributed in glass ampoules, sealed in the flame, thus avoiding the use of corks. Each package is dated four months ahead, after which we do not at present recommend its use.

The dose must be given subcutaneously, never into the muscle nor the skin, in the upper arm or in the back between the scapulae. The skin is prepared with tincture of iodine; this saves time over older methods of skin sterilization and is quite satisfactory. Three doses are given at ten-day intervals, the full course thus occupying twenty days; the first contains five hundred million bacilli, the second and third one billion each. It is possible that smaller doses, especially if more are given, may be equally satisfactory. Richardson and Spooner (Boston Med. & Surg. J. 1911, CLXIV., 8) have used four doses with five-day intervals, beginning with fifty millions and increasing to a maximum dose of three hundred millions, and their results are excellent. For our purpose the ten-day interval is most convenient and it merely follows the method long used in the immunization of animals in laboratories.

The dosage for women and children is proportional to the body weight, the normal dosage being designed for a man of one hundred and fifty pounds.

You are all aware that immediately following the vaccination there is a local and often a general reaction. The local reaction has never been troublesome and in younger persons it is often insignificant. When well marked it consists of a red and tender area an inch and a half or two inches in diameter; occasionally the axillary lymph nodes are swollen and tender, but never suppurate; no skin infections have been reported as the inflammation is aseptic and subsides in

twenty-four to seventy-two hours, leaving no trace. The same reaction, somewhat diminished in intensity, follows the second and third doses.

The general reaction, when present, consists of malaise, headache, fever, occasionally chills, quite rarely nausea, vomiting or diarrhoea. The general reaction in 128,903 doses has been tabulated and the table shows that the severe type of reaction occurs in only one to three persons per thousand. It is mild or absent in 97.1 per cent. after the first dose and in 98.3 per cent. after the third dose.

TABLE III.

No. of Doses.	General Reactions.				
	Absent.	Mild.	Moderate.	Severe.	
1st dose.....	45,680	68.2%	28.9%	2.4%	0.3%
2d "	44,321	71.3%	25.7%	2.6%	0.2%
3d "	38,902	78.0%	20.3%	1.5%	0.1%

No serious trouble follows severe reactions and their occasional occurrence is not a valid objection to the use of the prophylactic. In young people and in children it is rare to have either a moderate or a severe reaction, most being mild or absent. The troublesome reactions are encountered most frequently after the first dose, less frequently after the second, and after the third there is only one among a thousand persons. Their occurrence is difficult of explanation; many are no doubt due to the mental state; physicians and nurses, for example, observant of their symptoms, have worse reactions than any other group of persons. This, however, will not explain them all and it is reasonable to suppose that some nurses or physicians are hypersensitive from a previous mild and undiagnosed attack of typhoid. Persons who have already had typhoid fever are more apt to suffer from marked reactions than others; we have records of reactions in 124 such persons and the percentage of those which are moderate and severe is distinctly higher than the average.

Among soldiers, students and children troublesome reactions are rarely encountered.

In a few instances marked symptoms have appeared in twenty to thirty minutes after inoculation, leading to much prostration, some loss of weight and the symptoms enumerated above. Absorption of the vaccine is so prompt that it seems probable that the dose has been given either into the muscle or in part at least into a small vein. Auer & Meltzer (J. Exp. Med. 1911, XIII., 328) have shown that absorption is much more rapid from intramuscular inoculations than from subcutaneous. Accurate subcutaneous inoculation is a *sine qua non*.

It has been an invariable rule that no one be vaccinated who is not at the time in good health, and it is perhaps due to this regulation that practically no harm has come from the treatment.

One case of latent pulmonary tuberculosis was apparently lighted up by two injections; in two or three instances mental disease has apparently followed the administration of the prophylactic, but Captain L. L. Smith, M. C., who has examined the cases, assures us that a careful examination showed symptoms to have been present long before the prophylactic treatment was instituted.

Among the laity, especially among those who have been impressed with the statements of the anti-vaccinationists, there is an idea, more or less ill defined, that some damage to the constitution may result from the so-called typhoid poison in the vaccine; of course, such an idea is absurd theoretically, and practical experience in thousands of persons has shown the untenability of such beliefs. It is merely necessary to recall that the vaccine is a measured quantity of dead typhoid bacilli; in the course of a week the bacteria have been dissolved by the tissue juices, the liberated antigen has been anchored by the tissue cells and the corresponding anti-bodies produced; the body cells have been trained to recognize and to give the proper defensive response to typhoid infection. After thirty days from the beginning of the treatment none of the vaccine or derivatives of it remain in the body, but in the meantime immunity has been acquired; the tissue cells have been educated and can be counted upon to respond with the proper anti-bodies to overcome naturally acquired typhoid infection and prevent the development of the disease, just as our brain cells can be educated to respond to the proper stimulus with the multiplication table or other feat of memory.

There is no reason for believing that in a healthy person vaccination predisposes in any way to other infections; we know from the modern theories of immunity that toxins and anti-toxins are specifically related to one another; as antityphoid vaccine does not protect against para-typhoid fever, dysentery or cholera, neither does it predispose in any way to these or other diseases. Since June, 1911, it has been customary to vaccinate all recruits, about three thousand per month, against smallpox on one arm and against typhoid on the other; the simultaneous immunization has saved two or three weeks in time and has been entirely satisfactory.

Immunity, as shown by the presence of agglutinins in the blood serum, begins from the fifth to the eighth day after the first dose and continues to increase for a variable time, ten to twenty days after the third dose, when the maximum is reached. The following tables show the titre of the serum on various days. All examinations have been made with the macroscopic method, using one cubic centimeter quantities of serum dilutions and one normal loop of fresh agar culture of typhoid or a corresponding quantity of a broth culture killed with formalin.

J. H. H. was vaccinated December 2, 10 and 17, 1910, and agglutinations made as follows:

Dec. 2 to 6	.....	negative	
" 7	.....	positive	1/160
" 8	.....	"	1/2,500
" 9	.....	"	1/16,000
" 10	.....	"	1/32,000
" 12	.....	"	1/40,000
" 13	.....	"	1/64,000
" 14 to 19	.....	"	1/80,000
" 21 to 29	.....	"	1/100,000
" 30 to Jan. 3	.....	"	1/80,000
Jan. 4, 1911	.....	"	1/60,000
" 9	.....	"	1/40,000
" 16 to Feb. 20	.....	"	1/2,500
Feb. 28	.....	"	1/640

H. F. was vaccinated on December 2, 10 and 17, 1910. Agglutinations were made as follows:

Dec. 2 to 7	.....	—
" 8	.....	+	1/80
" 9	.....	+	1/160
" 10	.....	+	1/3200
" 12	.....	+	1/4000
" 15 to 23	.....	+	1/3200
" 24 to 29	.....	+	1/2560
" 30 to Jan. 16	.....	+	1/1280

These two cases may serve as types of weak and strong agglutinations. It will be observed, however, that the titre of the weaker serum is higher than is usually obtained in typhoid fever.

Bacteriolysins and opsonins are also present in the blood serum in constantly large quantities (Russell, N. Y. State Jour. Med., Dec., 1910; Boston Med. & Surg. Jour., 1911, CLXIV., 1-8), and also bodies capable of fixing the complement in the Bordet Gengou reaction.

The various antibodies diminish in quantity quite gradually, the agglutinins being present, as a rule, for over a year, and in the few cases we have been able to examine after one and one-half and two years they are still present. At one time there was a tendency to consider that the immunity conferred by vaccination disappeared with the agglutinins; we know, however, that agglutinins are present in larger quantity and last at least as long after vaccination as after typhoid fever, which gives, as a rule, protection for life, and further experience may show that artificially acquired immunity endures many years.

Col. Firth, of the British Army Medical Corps (Jour. Royal Army Med. Corps, 1911, XVI., 589), concluded from statistics recently collected in India that the immunity begins to diminish in about two and one-half years. His tables also show that even after four and five years (the maximum period of observation) the immunity is still considerable, as the rate per mille is, roughly, only one-fourth that of unprotected troops. We must therefore wait for future developments to know the duration of artificial immunity.

DURATION OF IMMUNITY AGAINST TYPHOID
FOLLOWING VACCINATION.

It is impossible to present comparative statistics of the vaccinated and unvaccinated since in our service the prophylaxis has been compulsory since September 30, 1911, and at the present time there are practically no unprotected. Over 70,000 troops have been immunized, and among these there have been fourteen cases of typhoid, with one death, due to intestinal hemorrhage.

The following table summarizes these cases:

TABLE IV.

Typhoid Fever after Vaccination.

Case No.	Patient.	Typhoid Developed.	Diagnosis Confirmed in Laboratory.		Result.	Station.
			Yes	No		
(1909)						
1	J.	6 days after 2d dose.....			Recovered	
(1910)						
2	T.	9 mos. after second dose.....	No		Recovered	Philippines.
3	S.	1 mo. after 3d dose.....	No		Recovered	Ft. Mott, N. J.
4	S.	4½ mos. after 3d dose.....	No		Recovered	Philippines.
5	L.	3½ mos. after 3d dose.....	No		Recovered	Ft. Benj. Harrison.
6	H.	1 mo. after 3d dose.....	No		Recovered	Ft. Washington.
7	P.	1 mo. after 3d dose.....	No		Recovered	Ft. Washington.
8	C.	4 mos. after 3d dose.....	No		Recovered	Philippines.
(1911)						
9	B.	9 mos. after 3d dose.....				
10	K.	5 days after 3d dose.....	No		Recovered	Camp Pt. Loma.
11	D.	.....			
12	B.	7 mos. after 3d dose.....	?		Recovered	Nagasaki, Japan.
13	W.	11 mos after 3d dose.....	No		Recovered	Philippines.
14	C.	6 mos. after 3d dose.....	No		Died hemorrhage	Porto Rico

It will be noted that the diagnosis was confirmed bacteriologically in only two of the fourteen; some may have been para-typhoid fever, a disease occasionally encountered in the army. There is some difficulty in the diagnosis of mild cases unless blood cultures be made, as no reliance can be placed upon the Widal reaction, which is always positive after vaccination regardless of the nature of the disease from which the man is suffering; in some of the earlier cases this was not appreciated and the diagnosis in at least three instances was made largely because of a positive Widal.

None of the cases throw any light upon the negative phase except perhaps the first; this man, however, crossed the continent from New York to San Francisco between the first and second dose and was no doubt exposed to the disease on the trip. One case in an unvaccinated man developed in the same regiment; none of ten others vaccinated at the same time had any further trouble.

At the end of December, 1911, a census showed that only 3,000 out of a total of 55,680 troops in the United States remained unvaccinated, yet 43 out of 45 cases of typhoid reported during the year were among the unprotected. It is not possible to base a ratio on these figures, as the number vaccinated at the beginning of the year was less than 20,000 and, at the end, over 50,000, yet the fact that only two cases occurred

among the vaccinated and 43 among the unvaccinated shows clearly that vaccination gives almost absolute protection against infection. It is highly probable that had the troops been exposed to smallpox to an equal extent, that at least as many infections would have occurred.

In the first quarter of this year we have had a striking illustration of the danger to young men of not being vaccinated. For various reasons a small number of men, not more than a few hundred, had not received the prophylactic; yet

two of these on detached service in cities have been infected, while no cases have occurred during the same time in the fifty to sixty thousand immunized troops.

The past year has seen the most severe test to which antityphoid vaccination can be put. In the British army in India over a hundred thousand men have been immunized, but the procedure was always a voluntary measure. We became convinced that the best results could only be obtained, as in smallpox vaccination, where everyone of susceptible age was protected, since every non-immune person is not only liable to infection, but may become a source of danger to his companions.

A division of troops, about 20,000 men, was mobilized in Texas and along our southern frontier, and upon the recommendation of Surgeon General Torney vaccination of all persons under forty-five years of age was made compulsory. As a result of this we have to record only two cases of typhoid, both ending in recovery, in the entire number of troops in the field (cases 10 and 11 in table IV.). We know that the immunity was not due to lack of exposure, since the disease prevailed to a considerable extent in both San Antonio and Galveston (F. F. Russell, Jour. Amer. Med. Assn., 1912 —). To be sure, our camps were more hygienic and sanitary than any we have had before, yet the men were permitted to visit town, where they became for the

time a part of the community, and were then exposed to infection; yet only two cases developed, one in Texas and one in California. It is highly probable that there were also a few chronic bacillus carriers among our own men, yet in spite of exposure to these foci of infection, the men remained healthy. It is apparent that individual protection by vaccination is the only form of prophylaxis against the elusive carrier and the only measure of protection which is independent of surroundings and good under all conditions.

The contrast between this camp and the camp at Jacksonville, Fla., in 1898, is striking, as has been shown by Col. Kean, of our corps (Jour. Amer. Med. Asso., 1911, LVII., 713-744).

Ten thousand seven hundred and fifty-nine troops were assembled at Jacksonville, among whom, according to Reed, Vaughan and Shakespeare, there were certainly 1,729 cases of typhoid and probably 2,693, with 248 deaths from the disease. At San Antonio in 1911, in a camp lasting about the same length of time, four months, there was one case of typhoid and no deaths. This improvement is not, of course,

due entirely to the vaccine, but represents the sum of our advances in field sanitation.

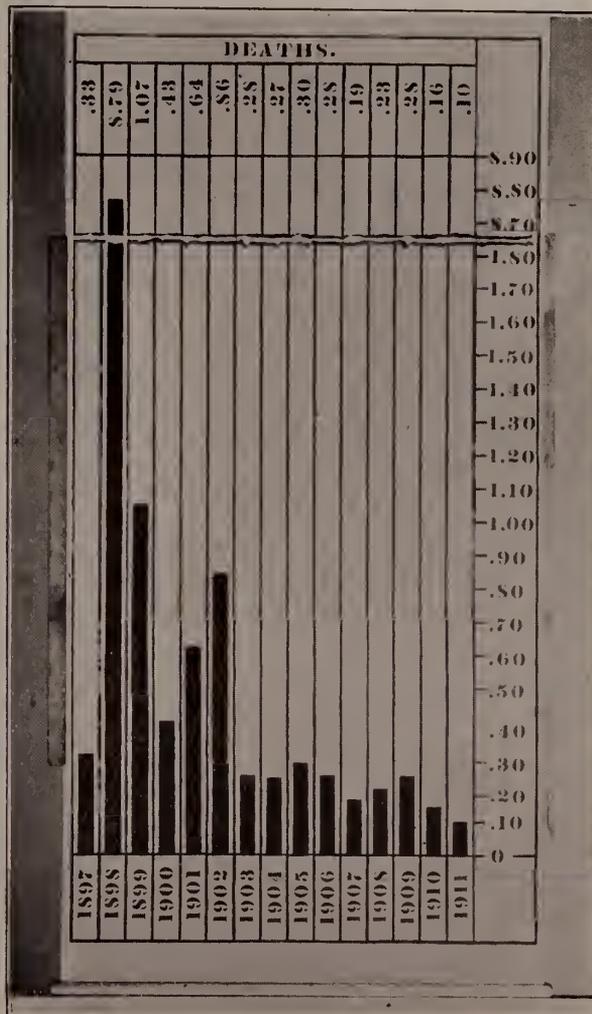
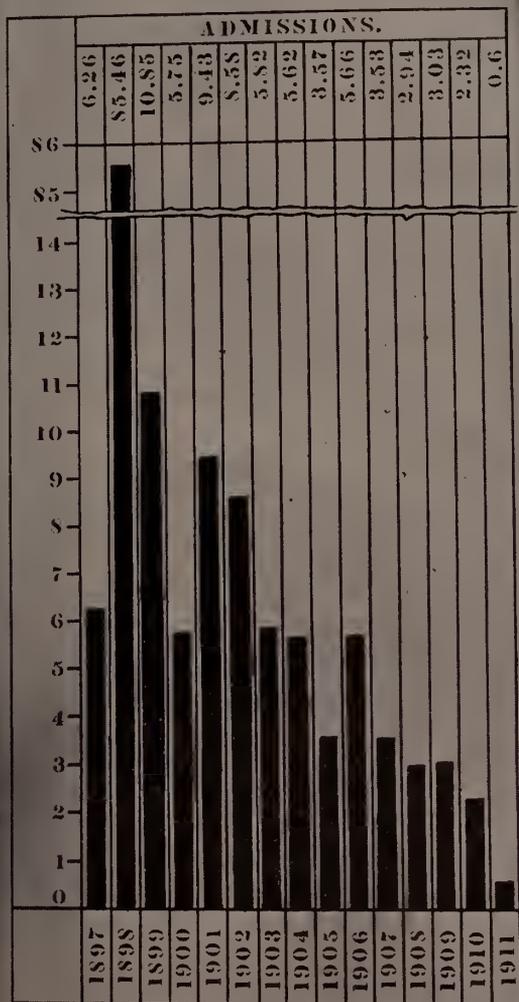
The effect of compulsory vaccination on the health of the army is now becoming apparent (see table I.). Orders for compulsory vaccination in the southern maneuver camps were issued on March 9, 1911. The order was made applicable to all recruits on June 9, 1911, and extended to include the entire personnel of the army under 45 years of age, on September 30, 1911.

The number of cases of typhoid per month is as follows: January, 3; February, 3; March, 3; April, 7; May, 3; June, 5; July, 4; August, 7; September, 5; October, 3; November, 1; December, 1; total, 45.

The table shows that the usual rise occurring during the summer and autumn has been prevented.

What deductions may we draw from these experiments for future guidance both in military and civil life? It is proven that the prophylactic treatment is without danger; that the protection is almost absolute, even under conditions of unusual exposure, and, further, that the entire process of immunization may be carried out in the field, with the troops under canvas, and while exposed to infection from local sources.

From experiences elsewhere we have come to learn that with the present method and dosage it is proper to vaccinate on the outbreak of an epi-



demic, as was done in Torrington, Conn., last year (Russell, Jour. Amer. Med. Assoc., 1912, LVIII., 1,331). There seems to be no reason for fearing a condition of increased susceptibility, the negative phase of Wright, immediately after vaccination, and we believe that on the outbreak of an epidemic all healthy persons should be vaccinated, whether exposed or not. On the occurrence of a single case in a family we now vaccinate all contacts, as would be done in smallpox.

It might be well for state boards of health to consider seriously the question of supplying this vaccine in addition to the other biological products furnished by them. There is already a fair demand for antityphoid vaccine and every indication that the demand will continue to grow. Some of the vaccine required will be supplied through dealers in biological products, but much of it will be required by schools, hospitals, asylums and charitable institutions, and the same reasons which have led to furnishing free anti-toxin are applicable to this product. When the demand is small it can most conveniently be purchased; as the quantity needed increases the question of its manufacture may then be considered.

I think we may conclude that antityphoid vaccination has proven its value and fairly earned a permanent place among the measures for the prevention of this widespread endemic disease.

Discussion.

DR. FRANCIS E. FRONCZAK, Buffalo: I believe I am one of the very few men present here, outside of the army and naval officers, who has taken the antityphoid prophylaxis. About three months ago Major Russell spoke in Buffalo before a medical society on the same subject, which he discussed so ably, intelligently and fully today, and I followed his advice.

The first injection, which was given to me by Captain Davis of Fort Porter, brought about the following symptoms within a few hours: Headache, nausea, nose bleed, chills, temperature 102, general malaise, which lasted for about thirty-six hours.

The second injection was taken ten days afterwards, accentuated all these symptoms more prominently and I had a temperature of 104, which lasted for two days, and I could tell where every bone in my body was by the pain I felt in them.

The third injection was taken ten days later (after the second injection), and the effects were almost as strong as the second.

At no time did I indulge in alcoholic drinks, as those who know me are well aware that I come very near being a teetotaler. I don't know whether I am immune or not, but I have, however, lost one thing, namely, typho-phobia. I was always afraid to drink any water unless I knew where it came from and seldom drank

any other except distilled or some of the table waters on the market. I had such a terrible feeling against drinking ordinary water that I pletely. I have dared today to drink even the prophylaxis, the typho-phobia disappeared completely. I have dared today to drink even the water here in Albany, which I have never done before, and I have visited Albany many a time. I did not have a test for agglutination made, but I shall have one made as soon as I return to Buffalo.

I have so much faith in the typhoid prophylactic measure that I have inserted this year in the budget of the city of Buffalo \$170 for the immunization of 500 people. The department of health of Buffalo will immunize anyone who cares to take it, especially those who go into the country, either to spend their vacation or to work, and I certainly will encourage doctors and nurses to take the vaccine.

In closing I might say that to me it seemed that each time I took the injection I went through the entire course of typhoid. Major Russell can see that I am a very faithful disciple of his.

TROPICAL CLIMATE AND ITS PHYSIOLOGICAL EFFECTS.*

By JAMES M. PHALEN, M.D.,

Captain, Medical Corps, U. S. Army.

THAT there is such a process as tropical deterioration no one will question, nor that this process is quite aside from all effects of bacterial infection or parasitic invasion. The cause of the changes induced by tropical residence is not so plain. Apparently the cause is climatic, but what elements of climate are responsible is still a disputed question. The factors of climate are temperature, rainfall, sunshine, humidity, atmospheric pressure, electrification and air currents, and in some wide variations of these from temperate conditions must be found the peculiar effects of tropical climate.

Residents of temperate regions usually hold either of two widely divergent views in regard to the tropics. The one is of a region of malaria-breeding swamps and of serpent-infested jungle, where the invading white man holds his life insecurely in his hands. The other is the view gathered from light opera scenic effects, in which the tropics are made up of vistas of palm groves, through which blue summer seas can be seen breaking upon beaches of golden sand, the whole flooded with soft sunlight. Somewhere between these extremes lies the truth. I will take the climate of Manila, Philippine Islands, as an example because it is the one with which I am most familiar, and because it has a similar climate to

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

that of all our tropical dependencies. To the newcomer who arrives in Manila at the beginning of the year, and this, by the way, is the time the newcomer with any choice should arrive, the climate will appear to be about ideal. To be sure, the middle of the day is hot, but the hours of the early morning and those of the evening after five o'clock are cool and the nights are sufficiently cool to make necessary the use of a light blanket. During this season there are occasional showers, but the rainfall is light. The average hours of sunshine is much above the mean for the year and the humidity is relatively high. This complex of atmospheric conditions produces a climate which is very pleasant when one is shaded from the sun. Nevertheless, light exercise, such as walking briskly, even at night, quickly brings on profuse perspiration and as the moisture does not evaporate readily on account of the high humidity, it causes considerable discomfort.

As the year advances there is a gradual change in the climate; the temperature rises gradually until it reaches its maximum in May. The rainfall, after reaching its lowest figure in February, rises gradually through March and April, and rapidly in May. With this increase in rainfall there is a corresponding rise in vapor tension, but this increase is not as rapid as that of temperature, so that while the actual amount of vapor in the air is increasing, the relative humidity falls steadily until April, when it bounds upward. In number of hours of sunshine there is a steady rise to include the month of April, after which there is a sharp decline.

The months of April, May and June comprise the most disagreeable season of the year. Temperature is now at its maximum, relative humidity is high, and the rains, though frequent, are not sufficient to materially modify the tem-

perature. This is the time, too, when the trade winds are changing from the northeast to the southwest, and such air currents as are present are gusty and changeable. In this season any exercise is accompanied by profuse sweating and the shade of a room is not sufficient to render conditions comfortable. Even at night it is so hot and humid that there is great discomfort trying to sleep, because of excessive perspiration.

With the establishment of the southwest trade winds in June, there is an increase in rainfall, which, together with the winds, materially affects the climatic conditions. During the following three months rains are of almost daily occurrence, and destructive storms are liable to occur. The temperature maintains a high mean and the humidity reaches its maximum. The sun is not visible as often as earlier in the year, but when it does shine, the heat is very trying. Conditions as to personal comfort are about as during the preceding season, except that the discomforts are of a lesser degree. The heat moderates in October, vapor tensions and relative humidity are less and the rainfall decreases greatly. By the first of December the conditions as described for January are again approximated.

The following table is a summary of the climatic conditions of Manila. It is compiled from the reports of the Philippine Weather Bureau, and the figures are in most instances averages for a large number of years:

To bring these figures nearer home I will say that it is only in the southern states that the weather conditions of summer approximate those of the Philippines for the entire year. It is only when the Gulf states are reached that the mean summer temperatures reach the annual mean for Manila, and even then the humidity remains much lower.

MONTH	Temperature			Humidity		Precipitation (Average Monthly)	Wind Prevailing Direction	Velocity Per Hour (Average)	Hours of Sunshine (Daily Average)
	Mean	Mean Maximum	Mean Minimum	Mean Relative	Absolute (a)				
	° F.	° F.	° F.	P. Ct.	Gr.	Inches.		Miles.	H.M.
January ...	77.	85.6	69.3	77.6	7.7	1.14	N.	4.8	6.13
February ...	77.7	86.9	69.1	74.2	7.4	0.39	E.	5.	7.26
March	80.2	89.8	71.4	71.8	7.8	0.73	E.	5.8	7.57
April	83.	94.3	73.8	70.7	8.5	1.08	E.	6.1	8.51
May	83.5	92.	75.5	76.7	9.2	4.	S.W.	6.6	7.38
June	82.2	89.8	75.4	81.	9.7	9.75	S.W.	6.4	5.30
July	80.8	86.3	75.	84.8	9.7	15.	S.W.	6.8	5.00
August	80.8	86.9	74.9	84.8	9.7	14.2	S.W.	7.6	4.37
September ..	80.6	86.9	75.	85.5	9.7	14.7	S.W.	8.1	5.05
October	80.4	87.8	74.	82.7	9.2	7.55	S.W.	5.6	5.35
November..	79.	86.3	72.5	82.	8.7	5.37	N.	4.4	5.24
December..	77.3	85.4	70.7	80.7	8.2	2.27	N.	4.2	5.16
Annual ..	80.2	88.2	73.	79.4	8.7	76.31		6.	6.12

(a) The absolute humidity is expressed in grains of aqueous vapor per cubic foot.

What are the standards with which to measure the changes due to climate? Some observations have been made upon the physiological processes of white persons resident in the tropics and these show some interesting changes of a constant nature. Some of these observations have been only general in character, while others have been made with considerable precision, most of those that follow being the result of investigation by the U. S. Army Board for the Study of Tropical Diseases as they occur in the Philippine Islands, of which board I was for two years a member:

Digestive System.—There is an idea prevalent that an entire change of diet is necessary in the tropics. If we accept the cravings of appetite as a criterion, then this is a mistake. Except that there is usually a distaste for fats and an increased desire for sugar and fruits, the ordinary diets of a temperate climate are relished. Certainly the idea that there is a distaste for meats and other nitrogenous foods is a mistaken one. As a rule, the newcomer to the tropics takes on some weight. The appetite remains good or may improve and this, together with the usual lack of exercise and the afternoon siesta, tends toward an increase of adipose tissue. These are the conditions, too, that are responsible for the malady known as tropical liver. In this condition there is an increase of blood in the organ, which may become a congestion, producing marked diminution in its functional activity. Another factor in producing tropical liver is the increased demand for fluids, which is answered by the use of beer, wines, or more often by the Scotch highball. A habit of constipation is a rather uniform result of this hepatic disturbance, a condition which is aggravated by the loss of body fluids by evaporation.

With those individuals, however, whose duties require exertion in the open air, as the soldier, for example, loss of weight is the rule. During the year 1909 a series of observations were made upon about 950 American soldiers in the Philippines, most of them recent arrivals in the tropics. Starting with the weight in January as a basis, there was found to be in July an average loss in weight of 3.6 pounds per man for the entire group, and in December the average weight was still 2.4 pounds below the January standard. Of these men 85 per cent. lost weight, 11 per cent. gained, while 4 per cent. remained stationary. Of the newer arrivals, the loss of weight was quite uniform, while for those of longer tropical residence there were wide variations both in loss and gain.

The Circulatory System.—In the blood and the circulatory apparatus we have probably the best measure of change due to tropical residence. About 3,500 observations upon blood pressure were made upon 900 men. The instrument used

was the Riva Rocci, as modified by Dr. Cook, this instrument having an eight centimeter arm-piece. Only systolic pressure could be measured. These observations gave an average of 124.1 m.m. in January, 120.8 in April, 118 in August, 124.2 in December. Accepting 123 m.m. as normal for men between 20 and 30, with this instrument it will be seen that these observations gave a normal average in the comparatively cool month of January, that there was a progressive fall in pressure during the hot months of summer and a return to normal in December. The changes in the cellular elements of the blood and the hemoglobin are quite constant. There is an increase in the number of the red cells and a decrease in the percentage of hemoglobin, the hemoglobin index showing necessarily an even greater diminution. The absolute leucocyte count remains at about the normal figure, while the differential count shows a high proportion of lymphocytes and a corresponding decrease in the proportions of the polymorphonuclear neutrophils from the standard considered normal for white men in temperate climates. Observations on 291 American soldiers having a year or more of tropical service were made by Wickline and the Army Board, with the following results:

The average red count was 5,099,000, the percentage of hemoglobin 90.2, leucocytes 7,181, while the differential counts gave approximately polymorphonuclears 57 per cent., lymphocytes 32.5 per cent., large mononuclears 6 per cent., eosinophiles 4 per cent., and mast cells .5 per cent.

Wickline has shown that these blood changes are the result of a gradual process and that they become more marked as the length of tropical residence is increased. Chamberlain and Vedder have recently published the result of their observations on Arneith's nuclear classification of neutrophils in the Philippines and these show that in the white man, after residence in the tropics, there is a decided shift to the left of the Arneith count. There may be difference of opinion as to the significance of the Arneith classification. If we accept the idea that the neutrophile with three or four nuclear fragments is the mature cell and therefore the most highly phagocytic, the figures given by these investigators would indicate a diminution in the average phagocytic power of the neutrophilic cells. As the number of these cells is likewise diminished, it will be seen that the loss of phagocytic power of the blood of such individuals may be serious. In the blood of the Filipino there was an even greater shift to the left of the Arneith count than in the case of white men. This may account for the lack of resistance they show to new maladies and to many endemic tropical diseases. In view of the often expressed idea that blondes do not stand tropical residence as well as brunettes, it is interesting to note that there was no difference

of any consequence in the Arneth count between groups of blondes and of brunettes.

Respiratory System.—Castellani cites Rattray's studies upon the influence of tropical climate upon respiration, which show that the lung capacity is increased in proportion to the temperature and humidity. This increase he attributes not to actual increase of chest capacity, but to a diminished supply of blood to the lungs, the blood being diverted to the congested skin and liver. The statement of Rattray that the number of respirations is reduced is not agreed with by most observers and the studies of our Army Board are to the contrary. Respiratory counts to the number of three thousand made upon men after an hour or more in the open air gave an average of 21.7 respirations per minute. No doubt a part of this acceleration of breathing was due to exercise, how much it is impossible to estimate.

Temperature.—The mean average mouth temperature for man in the temperate zone has been determined at 98.36 F., though these results were obtained by taking only the figures from 8 A. M. to midnight. The average for the twenty-four hours is probably lower. Crombie gives the mean morning temperature at 97.763 F. Three thousand observations upon soldiers in the Philippines gave an average morning temperature of 98.786. This is a full degree above Crombie's figure for morning temperature and about .4 degree above the mean daily temperature.

Excretory System.—I have already spoken of a tendency to constipation due to impairment of liver function and to increased evaporation of way of the skin. The urine is diminished in quantity, and this diminution is not merely a concentration, as the solids are lacking as well as the water, urea and chlorides particularly being below normal. The urine is high colored and it is said that pigments are increased absolutely. Excretion by way of the skin is very active, and perspiration is likely to be quite annoying. The activity of the cutaneous glands is also shown by the frequency of toxic rashes. Those drugs which in temperate climates are liable to produce dermatitis are much more likely to do so in the tropics, and idiosyncrasies to fruits and other foods characterized by skin eruption are of frequent occurrence. At times sufferers from chronic nephritis are tempted to the tropics by the hope that the skin acting vicariously for the kidneys, they will undergo improvement. If it were an established fact that the skin did take up all the functions of the kidneys, this climatic treatment would be theoretically correct, but in practice nephritides do not do well in the tropics, probably on account of the stress of the climate on their other vital functions.

Nervous System.—It is upon the nervous mechanism that atropical climate works some of its more apparent and yet least measureable effects. The cells of the nervous system are stimulated by the climate at first, but this soon gives place to a depression, the manifestations of which are grouped under the term tropical neurasthenia. Probably the most common symptom of nervous exhaustion is impairment of memory, a condition well recognized throughout the Army and given the facetious title Philippinitis. Inability to perform consecutive mental work, irritable temper and proneness to worry over trifles are other common manifestations. The subjects of this condition suffer from various kinds of phobias, especially of diseases of the tropics, and are likely to be morbid on the subject of their own physical condition. The functional disturbances of the vascular system common to neurasthenia in all parts of the world are particularly frequent. The U. S. Army rates for insanity formerly were nearly twice as high for the Philippines as for the home stations, but during the past seven years the differences have been such as to be negligible. To fully appreciate the extent to which tropical deterioration may extend one has only to observe the human white derelicts who are found uncertainly afloat in all parts of the tropical world. The individual of this type has lost all of his moral and mental fibre and is quite content with the life of the low-class native into whose society he has finally gravitated. In the Army and the civil service in the Philippines the eccentricities of the tropical neurasthenic are explained by the remark that "he has missed too many boats."

To sum up the effects of tropical climate, these are loss of weight, lowered blood pressure, increase in temperature, pulse and respiration, an increase in red blood cells and loss of hemoglobin, reduction of the proportion of polymorphonuclear leucocytes, with a still greater reduction of phagocytes, and depression of nerve cell activity.

To return to the question of climate, some of its elements can be at once eliminated as a cause of physiological changes. In this list can be placed atmospheric pressure and electrification, as also can wind.

The probable causes are practically narrowed down to sunlight, particularly its chemical rays, and to heat plus humidity. The investigations of the Army Board have led us to the belief that the influence of the actinic rays of the solar spectrum has been greatly overrated, and this is the opinion recently arrived at by Dr. Freer of the Bureau of Science of Manila, who has devoted a great deal of work to the subject.

Many of the physiological effects due to tropical residence can be produced experimentally to an exaggerated degree by the influence of moist heat. In the course of our studies upon the sub-

ject, we subjected four young soldiers, who volunteered for the purpose, to four hours' exposure to a temperature of from 92 to 98 degrees F., with the moisture at the saturated point. At the end of four hours the pulse rate had been increased an average of 21 beats per minute, the temperature had risen an average of 2.1 degrees F., while the blood pressure had fallen off 16 m.m. on the average. The loss of weight averaged 3.5 pounds per man, while the strength as recorded by Brem's ergometer, was reduced 38 per cent. on the average. I stayed with these subjects during the experiments and made observations and can subscribe to the fatigue and relaxed condition of which all complained and of loss of appetite for the following meal. To explain these effects we have only to realize the rôle that humidity plays as an adjunct of heat. Its ill effects are to interfere with heat loss by evaporation, and as evaporation from the skin is the main process by which a balance is maintained between heat production and heat loss, such an interference is serious. With a high external temperature and heat loss practically abolished by humidity, a vicious circle is established. With the rise of external temperature oxidization in the system is increased with more heat and a still greater rise in body temperature. The progressive action of these factors on temperature, pulse and respiration is shown in the experiment just described. In contrast to this, Castellani quotes Blagden and Fordyce's observation of men sustaining a dry temperature of 240 to 260 degrees F. without any disturbance of bodily temperature, showing that the heat regulating apparatus of man can take care of very high external temperature if the air is dry.

And now to the practical application of these facts. If it had been true that the agency at fault was the actinic ray, then protection from it would have been easy by wearing clothing of appropriate coloring. Against the influence of heat and humidity there is no such easy remedy. These agents are everywhere and at all times and the best that can be done is to reduce to a minimum the results of their influence. In order to do this one must realize that it is necessary to adapt his clothes, his work and his diversions, in fact, his whole habits of life, to the local conditions of the climate. To one who is able to do this, to surround himself with good hygienic conditions, and to withstand the stress of nostalgia and monotony, there should be no great hardship in a limited number of years of sojourn in the tropics. For, after all, deterioration due to climate is a small factor in tropical morbidity, compared with such infections as dysentery and malaria. I believe, however, that insidious as are the effects of heat and humidity, they are still an efficient bar to permanent white colonization of the tropics, or to the advance of the native peoples of these regions to anything approaching a high state of civilization.

PROPHYLAXIS OF SOME TROPICAL INFECTIONS.*

By Lieut. F. M. SHOOK, M.D.,

U. S. Navy.

"TROPICAL Infections" is a term which is very elastic and which covers a range of disease so broad that a consideration of them all would be manifestly impossible in a paper limited in time. The environment of the tropics in different parts of the world varies to such a degree and the infections present in these localities differ so widely in etiology that one could not formulate any scheme of prophylaxis against the different infections which would be applicable to them all. It is necessary, therefore, to restrict a paper of this sort to some small portion of the subject, and as tropical America is right at our door a discussion of some of the individual and general measures of prophylaxis against the infections of tropical America, with the results attained, may be of interest to the section.

All measures of prophylaxis may be loosely divided into two general classifications: those which the individual may make use of for self-protection, and those which the community or the state provide for and enforce for the general welfare of all. The first are most necessary when the second are absent. For example, in cities like Guayaquil or La Guayra, where the general principles of preventive medicine are conspicuous by their absence, the individual must rely upon himself for any protective measures, whereas in a district such as the Canal Zone is at the present time or as Cuba was during the American occupation, the scheme of maintenance of health is founded upon the enforcement of certain general measures through a central authority, which is invested with proper power, and there is comparatively little need of individual measures of prophylaxis.

Of the important infections continually present in tropical America in endemic or epidemic form, malaria heads the list by reason not only of its direct and indirect effects as seen in the high death rate of malarial infected districts, but also on account of its far-reaching effects as shown in the physical and mental deterioration of a malarial infected race. An individual who comes to a district which is infected with malaria in endemic form has at his disposal a number of measures which will guard against infection. Some of these measures are applicable to all tropical infections, and, indeed, to all infections, whether tropical or non-tropical. These are the general measures which may come under a rather vague term of "keeping up the resistance of the individual." This hinges primarily upon those fundamental principles of food, water, sleep, work and play. The requisite proportions of these should be more carefully adjusted in

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

the tropics than in a temperate climate. With poor food, a bad water supply, an insect-disturbed sleep, with too much work and no play, physical and mental bankruptcy is in the immediate foreground, and with the infective agents of the tropics ready at all times, the margin of safety of the individual is much narrower than in a northern climate. Food supply in the tropics is a problem in itself, and the shipment of meat and vegetables for such long distances with their proper storage and distribution after arrival has been worked out satisfactorily within the past few years only. Specific rules as regards diet in the tropics cannot be laid down, but practical experience demonstrates that a working force will be more efficient on a diet that is well cooked and liberal, with about the same proportion of proteids and carbohydrates as farther north. The quantity of food should vary about as it does here, with the occupation of the individual. Daily expenditure of a large amount of physical energy will require a greater number of calories of ingested food. A pure water supply in the tropics is theoretically a simple proposition, but practically it is even more difficult than here to prevent infection by water-borne diseases, such as dysentery, cholera and typhoid. When epidemics of the latter occur in civilized nations from a contaminated water supply it is not difficult to estimate the increased probability of water-borne infections in a district where there are present, in addition to typhoid, the amebic and bacillary dysenteries, and the ever-present possibility of introduction of cholera. Drinking water must be boiled or distilled, and even then unless personal supervision of these processes is made, there will be more or less contamination by native servants. It is the experience of residents in the tropics that for continued efficiency the time devoted to recreation should be as carefully observed as the time for work, and that proper proportions of these are indispensable for continued health and well-being. Lack of physical and mental diversion is common to most of the tropics, although wherever the white race has settled permanently, as in the British colonies or the American possessions in the Philippines or the Canal Zone, experience has shown the importance of recreation.

After as careful attention to these elementary principles of existence as is possible in the particular environment in which the individual has been placed, the effective measures of prophylaxis which he may make use of to cope with the endemic and epidemic tropical infections of America are somewhat limited. His measures against malarial infections must be directed against the anopheles mosquito primarily. His dwelling should be built on a hill or wind-swept point of land, as far as possible from the natives, who are the reservoirs of the infection. Then if the house is well screened with a fine-meshed

copper screening, and mosquito nets are used at night, the number of attacks of malarial fever will be greatly diminished. The administration of small doses of quinine as a prophylactic measure has been very successful, particularly with the Italians. The Italian government has made quinine a cheap drug, easily accessible to the inhabitants of malarial infected districts, and the Italian death rate from malaria has been considerably reduced in consequence.

There are certain inherent defects in all of these measures, however, which render imperfect results, and none of them can be carried out successfully by the average individual (with the possible exception of the taking of quinine for prophylactic purposes) unless the individual can devote most of his time and energy to prophylactic measures, and this is manifestly an impossibility. Inspections must be made for mosquito breeding places several times a week in the rainy season by men who are trained for that work, and all breeding places drained or rendered harmless by crude petroleum or some larvicide. Copper screening must be renewed every three to six months, as oxidation processes proceed very quickly in the heat and moisture of the tropics. This requires skilled labor again. The native population must be examined and treated with quinine in order to reduce the number of malarial carriers. This requires skilled administrative ability, with power to enforce its decisions. Wherever measures of individual prophylaxis alone have been tried the results have been imperfect, and it has been proved that sanitation in the tropics to be satisfactory must be handled by a force of trained men, who have the proper authority to enforce their measures.

An example of organized efficiency may be seen in the Canal Zone in Panama, where a district which had been one of the pest-holes of the world has been made a place where one may live with but slight danger of death from the acute tropical infections, such as malarial fever, yellow fever, blackwater fever, plague, or the dysenteries, amebic or bacillary. Yellow fever and plague have been eliminated completely by a rigid system of quarantine of ships from infected ports and isolation of all suspects. Personal measures of prophylaxis play a small part in the scheme of sanitation, which depends upon an organized force under a central authority. It is interesting to note the results obtained. The admission rate of malaria to the hospitals has dropped from 6.83 per cent. of the entire working force in 1906 to 1.55 per cent. in 1910, and still lower in 1911. In 1906-07 the deaths from malaria were 205, and in 1910-11 (fiscal year), 41. The malarial admission rate and the malarial death rate has been reduced approximately four-fifths in five years. These results have been obtained by training men for all phases concerned in the prevention and treatment of malaria. Specialization along definite lines has

been necessary for so complex a field, and a force of trained men has been engaged continually in the eradication of mosquito breeding places, the administration of quinine in prophylactic doses to laborers and the screening and repair of houses. With this organization there were last year 42 deaths from pernicious malaria, and with an average working force of about 48,000 men, there were 9,940 hospital cases of malaria. This figure may be increased by the addition to it of cases of malarial fever in which hospital treatment was not necessary, or milder cases of acute and chronic malaria that were self-treated. No data as to the number of these cases are obtainable. Malarial infection is still a problem which exacts a heavy toll in sickness and death after five years of work in this district. The cost of the anti-malarial work is about \$2.00 per capita for a population of about 100,000. The black-water fever death rate has remained very nearly stationary for the past five years. Amoebic dysentery, with its chief complication, liver abscess, remains one of the most serious and apparently ineradicable infections of the tropics. Theoretically, this should be an easily prevented infection, but practically, even the use of distilled water for drinking purposes and the importation of vegetables and fruits from the temperate zone do not eliminate this disease. This is evident in the experience at Panama, where in 1906-07 the deaths from dysentery were 59; 1907-08, 35; in 1908-09, 19; in 1909-10, 13, and in 1911-12, 18. Liver abscess caused 5 deaths in 1906-07, 11 deaths in 1907-08, 8 deaths in 1908-09, 6 deaths in 1909-10, and 8 deaths in 1910-11.

CONCLUSIONS.

Individual measures of prophylaxis play a small part in the sanitation of an infected district in the tropics.

The results of sanitation when directed by a central authority with a skilled force are so brilliant that the added risk incident to work in the tropics has been reduced to a small fraction of its former figure. That there is such a risk, however, in addition to the effects on the white man of the continued heat and moisture of the tropics is seen in the failure to eradicate such infections as malaria and dysentery in a district such as the Canal Zone.

Discussion.

DR. JOHN M. SWAN, Rochester: The problems of tropical pathology and hygiene are of great interest and importance, particularly to those men who are engaged in actual work in the tropics and in sub-tropical climates. The important point that interests the sanitarian in the United States is whether the tropical infections can be introduced into the northern parts of our territory. We have in this country many ports that are in constant communication with

tropical countries. Galveston, New Orleans, Mobile and Savannah are ports which have a sub-tropical climate and in which a tropical infection, for example, yellow fever, might easily be introduced and develop to epidemic proportions.

Baltimore, Philadelphia and New York are ports which have a climate for two or three months in the year which is very nearly sub-tropical in its character. Could a tropical infection be introduced into one of our northern ports?

The infections may be classified as (1) those spread by carriers and intermediate hosts, and (2) those spread by carriers and infected food or water.

In the first class of infections it would be necessary to have the intermediate host living in the port for the spread of the infection brought by the carrier. The carrier of malaria has the gametocytes in his blood and the species of anopheles mosquito which acts as the intermediate host is present in all of our ports. All of our ports are inhabited by rats; no one can tell how many rats are present in our seaports unless a rat campaign were established. In San Francisco 10,000 rats were killed every week for many weeks during the plague measures of 1908-1910.

The officers of the United States Public Health and Marine-Hospital Service give us an excellent service in the detection and exclusion of carriers. The health officers of our ports ought to undertake energetic campaigns for the extermination of intermediate hosts; flies, rats, and mosquitoes of all species.

DR. F. C. CURTIS, Albany: A medical friend has recently given us a story of his collected observations from a short visit to the Isthmus, one of which showed the closeness of inspection. If, he said, five mosquitoes were discovered about a house, investigation was made for local conditions allowing their propagation; every smallest thing which might hold water was removed. In one case persistence of malaria continued without apparent cause. It was found finally that it was due to sagging roof gutters. Malaria is the only one of these diseases which concerns us and we have in it only a trifling contribution to mortality in this state. There are points, especially along the lower Hudson valley, where it prevails. At North Tarrytown it developed abruptly not long ago, and was found to ensue upon the cutting off of the upper part of a tidal brackish water swamp for decorative purposes by a dyke, rendering this part a fresh water swamp. The filling in of this swamp has ended the prevalence of malaria. We can never lose interest in any report upon the sanitary work in our tropical territories, which are such graphic triumphs of sanitary work.

DR. JAMES M. PHALEN, U. S. N.: The casual visitor to the tropics is very apt to minimize the baneful effects of tropical climate plus the infections endemic in warm climates, and it requires some years of residence in the tropics to realize that although the exceptional individual may work in the tropics for a lifetime without being affected by the additional load put on his back by the climate, the second generation will surely show physical and mental deterioration. The white man cannot conquer the tropics unless he leads an artificial life. He must take long vacations in a temperate climate at frequent intervals, and in order to start his offspring with a proper physique they must be sent out of the tropics at an early age and kept in a colder climate until physical and mental maturity. The British have learned this by long experience in their colonies and Americans must be guided by their experience.

DR. ALEXANDER LAMBERT, New York City: One source of malarial infection coming to the northern ports is the fruit steamers coming up from the tropics. In New York there have been individual cases of tropical quartan malaria developing suddenly in longshoremen helping discharge the vessel which could be traced di-

I am much interested in different values expressed by the speaker as to personal prophylaxis and general health control and the slight relative value placed on personal prophylaxis as among my patients I have watched several engineers who come and go in the tropics and have not acquired tropical diseases because of their careful personal care of prophylaxis.

PRACTICAL RESULTS OF SURGERY IN EPILEPSY.*

By G. KIRBY COLLIER, M.D.,

SONYEA.

I WOULD like to state that I have nothing new to present relative to the surgical treatment of epilepsy, but merely to report the results in a series of cases operated upon at the Craig Colony and to reiterate a few facts relative to surgery as an aid in treatment, emphasizing the importance of most careful medical treatment, both before and after surgical intervention.

I think it is recognized by all that surgery is responsible for a great deal of damage done to the epileptic. It is not my object, however, to criticize the surgeon, but it is nevertheless true that many epileptics would have shown improvement had they never received indiscriminate surgical treatment earlier in their epileptic life. It

is not to be understood by this that I refer to the organic cases that show tumor of the brain, etc., nor to the traumatic cases with a definite history of an injury. I think that the untoward effects consequent upon surgical treatment are due to the fact that all operative procedures have been directed to the brain and not enough attention paid to other abnormalities.

Only a few years ago it was claimed that 50 to 60 per cent. of those cases trephined recovered, but today it is evident that a much smaller number, probably only 4 or 5 per cent., show any marked improvement. The earlier observers were misled by the fact that the greater number of epileptics improved after any surgical intervention, just as there is frequently a lessening in frequency, and even at times a cessation, of seizures following an acute infection or illness. This may be due in part to the anæsthetic or to the more careful supervision of the patient while under surgical treatment. The subsequent history of the greater number of these cases shows, as a rule, that there is return of the seizures. No cases of epilepsy should be reported as having recovered following any surgical intervention until at least two years have elapsed following the last seizure, and it would probably be safer to say five years.

In all cases of supposed traumatism a most careful examination should be made as to the nature of the injury, the character and mode of onset of the seizure, and lastly, but most important, the fact that the traumatism may only have been an incident, must be well considered.

In those cases with local symptoms, excision of the irritated portion of the cortex is of benefit in a small number and only where operation is done early. On the theory that the idiopathic cases might have been due to an anæmia of the brain, excision of the cervical ganglia of the sympathetic system was first recommended by Jennesco, the effect of the operation being similar to that obtained by the use of amyl nitrate. In 1902 Winter collected 213 cases and reported a recovery rate of 6.6 per cent. In 1903 Dr. Roswell Park did a bilateral cervical sympathectomy upon three patients at the Craig Colony, the report of which was published in the *Journal of Nervous and Mental Diseases*, April, 1905. Case No. 1 had three seizures within four months following the operation, but since then he has had none, and is now a successful attorney in a western city. Case No. 2 was removed from the Colony about six months after the operation, but we have since learned that she has continued to have seizures and frequent periods of status. Case No. 3 is still at Sonyea and averages from five to eight seizures per month.

We scoff at the idea of reflex epilepsy, but undoubtedly the early removal of some source of irritation, such as enlarged tonsils, refractive errors, etc., however remote it may be from the brain, will at times be followed by favorable re-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

sults. Many of the gastro-intestinal disorders complained of by the epileptic may be, and probably are, due to some abnormal intestinal condition, and why should not this reflex irritation such as a diseased appendix or gall bladder, be attacked by the surgeon? Removal of the appendix, correction of an angulation of the descending colon, and many other operations have been recommended. La Place in 1906 made a preliminary report of four cases which he treated by appendicostomy with colonic irrigation. All four patients showed a lessened number of seizures following the operation, but I have been unable to find any further report of these cases. Stewart McGuire has reported one case of recovery following appendectomy.

In the series of cases now to be reported as having been operated upon at the Craig Colony there were 12 appendectomies. Eight of these showed no improvement, and four have improved.

In December, 1911, we admitted to the Craig Colony a man, aged 36 years. History of onset of seizures at the age of 18 years. He had a large tumor mass of the left lumbar region, this being about seven inches long and five inches wide. He stated that this tumor had been present since the age of 14 years and had been gradually increasing in size. In February, 1912, this tumor was removed and found to be a fibrolipoma. Patient stated that preceding seizures he had a peculiar sensation in the region of the tumor and occasional photophobia. Attacks did not always occur whenever he had a pain in this region, for by brisk rubbing when he first felt the pain in this region he could sometimes prevent the attack. Since the removal of tumor patient has had no seizures. Of course, sufficient time has not elapsed in this case to prove anything. This man's history shows that he had one sister insane. Otherwise negative.

In August, 1911, there was admitted to the Craig Colony a man (I. V.), aged 22 years. Family history of insanity, alcoholism, epilepsy, rheumatism and tuberculosis. Following a herniotomy in January, 1910, he had his first seizure and they have recurred at intervals since that time. A few months later he was operated upon for appendicitis. After his admission to the Colony he continued to have a large number of seizures, frequently in series, and complained of abdominal pain. He showed a post-operative hernia, and in January, 1912, at Sonyea the abdomen was opened with the intention of repairing this hernia. A large mass of dense adhesions were found about the cæcum. This man had no seizures for about three weeks following the operation, but he has been having an occasional seizure of late. However, they do not occur as frequently as before, but I would like to mention that a sufficient period of time has not yet elapsed in this case.

Among the minor surgical procedures that

may be mentioned is lumbar puncture. Theoretically, lumbar puncture would be indicated in epilepsy if the increased intracranial pressure existed before the seizure. Many reports have been made as to patients treated by lumbar puncture, but the results recorded have usually been unfavorable. My own experience has shown me that lumbar puncture is of value in the treatment of status conditions, along with other treatment, but as to any permanent benefit, I do not believe that we can expect any.

Alexander, in the London *Lancet* of September 30, 1911, calls attention to the presence of œdema beneath or in the pia arachnoid, and cites 20 cases in which he has operated, in all of which there has been a retardation in the progress of the disease. He states: "In these cases the affected motor area is covered by more or less œdema of the pia arachnoid, and this œdema probably so affects the cells of the cortex as to produce or cause the epilepsy or imbecility." The operation which he calls "fenestration of the dura mater" consists in the removal of a larger or smaller area of skull and draining the œdematous pia by multiple incisions.

We have done this operation in a somewhat modified form at Sonyea in six cases and I append herewith a summary of them:

P. H. (2722). Admitted March, 1909.

A well nourished and muscular adult, aged 28 years. Family history negative as obtained. Assigned cause, indigestion. History of scarlet fever at 10 years and a blow on the head at 11 years. Prior to admission general convulsive attacks occurred every week. Preceding seizures, for about ten minutes he had convulsive movements of the left palpebral muscles and left hand. Mental status very fair. Later aura involved the leg, but was not always followed by a convulsion. In April, 1910, a fenestration operation was done in two stages over the right motor area. Four three-quarter inch trephine openings were made, they being then connected with a Gigli saw, except at the base. The osteoplastic flap was then turned back and multiple incisions were made in the dura, permitting the escape of considerable fluid of a gelatinous nature. Marked increased intra-cerebral pressure. Patient made an uninterrupted recovery. During 1909 this man had 29 seizures. He was discharged in October, 1910. Re-admitted on December 8, 1910. During the 11 months in 1910 that he was at Sonyea he had one (1) seizure. During 1911 he had 22 seizures, and during the months of January and February, 1912, he has had two seizures.

C. D. (2285). Admitted in October, 1907. Aged 17 years. Family history negative as obtained. First seizure at the age of 15 years, on the day following a fall through the ice. Aura formication and numbness. A well nourished young man. High grade imbecile. In 1910 fenestration operation was done in two stages, with

drainage as in previous case. Patient made a good recovery from the operation. Record of seizures as follows:

1907	20
1908	82
1909	70
1910	40
1911	40
1912	12

W. D. (2479). Admitted May, 1908. Age 22 years. Family history negative. First seizure at the age of 14 years. As the assigned cause it was stated that the patient had a fall on the pavement, striking on forehead, about a year prior to his first seizure. Preceding admission, seizures occurred about four or five times a week. In January, 1910, a fenestration operation was done. Record of seizures as follows:

1908	20 seizures
1909	26 "
1910	27 "
1911	12 "
1912	0 "

H. E. (205). Admitted April, 1907. Age 31 years. Father alcoholic. First seizure at the age of eight years. Supposed to have been due to fall from wagon. At the time of admission attacks occurred daily. Fenestration operation done on this patient in February, 1911, and on the day following his death occurred, autopsy showing that death was due to chloroform necrosis.

W. B. (3395). Admitted October, 1911. Age 21 years. Family history negative. Age at onset 11 years. Assigned cause, forceps delivery. Prior to admission seizures occurred every two or three days. Aura dizziness. Seizures occurred at frequent intervals, and prior to the operation they were of an incomplete type, characterized by convulsive movements of the left arm and leg and of the face. No loss of consciousness at these times, but he had frequent Grand Mal attacks. Fenestration operation was done on March 11, 1912. Marked intra-cerebral pressure, with the exit of thick gelatinous fluid. Patient made a good recovery from the operation and has had no seizures up to this time. Seizure record as follows:

1911.	
October	150
November	43
December	431
	<hr/>
	624
1912.	
January	203
February	5
March	148
	<hr/>
	356

F. A. C. (2860). Admitted December, 1909. Age 26 years. Family history negative.

Convulsions occurred during dentition and they have recurred at frequent intervals since. Prior to admission they occurred every two or three weeks. Mental status fair. For some time after admission he complained of abdominal pains, referable to the right iliac region, and in September, 1911, an appendectomy was done and at the same time the cæcum and ilium were released from peritoneal adhesions and bands. Patient made a good recovery from this operation, and on March 31, 1912, a fenestration operation was done, from which he also made a good recovery. Too short a time has elapsed following the operation in the last two cases to show anything. Records of seizures is as follows:

1909	6 seizures
1910	27 "
1911	43 "
1912	14 "

Venesection as a surgical aid is not practiced as frequently now as it should be. Physicians of former years used this in the treatment of various conditions and probably brought it into disrepute by its overuse. Today we find many medical men opening the median basilic or some other vein for the treatment of pneumonia or some other conditions, and it has proven of value in the treatment of status. It is my plan to open the median basilic vein and at the same time give a normal saline solution intravenously or subcutaneously. Results, as a rule, have been very favorable.

I append herewith a list of the surgical cases at the Colony, not, however, as you will see, to demonstrate any remarkable results as regards the improvement in the patients' epilepsy. In some there has been a very noticeable improvement in their epilepsy, and in all some improvement in their general health. It should be remembered that these patients were all cases of long standing, as it is very difficult to get the relatives of patients to send them to a public institution until they have tried every other means at their command.

SUMMARY.

	No. of Cases	No Im-provement	Im-proved	Re-covered
Fenestration of Dura.....	7	2	5	0
Appendectomy..	12	8	4	0
Appendectomy with Resection.....	1	0	1	0
Adenectomy	1	1	0	0
Herniotomy	3	1	2	0
Tonsillectomy	5	3	1	1
Nephrectomy	1	0	1	0
Salpingo-Oophorectomy ...	3	3	0	0
Salpingo-Oophorectomy and Appendectomy	3	2	1	0
Salpingo-Oophorectomy and Vento-suspension	2	0	2	0
Plastic Operation, Abdominal Wall—Hernia	2	1	1	0
Removal of Hemorrhoids...	4	4	0	0
Hysterectomy	1	1	0	0
Circumcision	19	14	4	1
Totals	64	40	22	2

CONCLUSIONS.

1. Early in the patient's epileptic life, surgery can be of benefit, and but little can be expected in cases of long standing.
2. Operations for the relief of epilepsy are undoubtedly disappointing and but seldom curative.
3. All abnormalities calling for surgical treatment should receive attention.
4. Patients under surgical treatment should be most carefully observed, both previous to and following operation.
5. Medical treatment should be continued.
6. No epileptic should be pronounced as having recovered until two (2) years, and better four (4) years, have elapsed following operation.
7. Lumbar puncture and venesection are of value in the treatment of status conditions in conjunction with other methods of treatment.

END RESULTS OF HEAD SURGERY IN
EPILEPSY.*

By J. F. MUNSON, M.D.,
SONYEA.

WHETHER from a feeling of helplessness, combined with a desire to do something to relieve our epileptic patients, or whether from a genuine belief in the efficacy of the procedure, surgery upon the heads of epileptics has become a well recognized therapeutic agency in many of the epilepsies. So much has surgical intervention impressed itself upon the therapeutics of the disease that even the patient and his friends often raise the question of operation, and are even inclined to disappointment if their suggestion is not acted upon.

Our valuation of any procedure is apt to be like a pendulum, swinging first far to one side in the extravagance of the claims made, and then swinging as far in the opposite direction as these claims are disproven; finally, however, a middle ground is reached. There can be no question that in the past there has been much ill-advised and indiscriminate operative intervention in the epilepsies, and some of the cases, viewed either from the purely surgical point of view or from the standpoint of the epileptologist, are sad commentaries on the ill-judged activity of the surgeon.

I am presenting herewith a number of cases in which some surgical intervention was undertaken on the head, and which afterward came to autopsy:

CASE I.—A14. Father was intemperate in youth and now has heart disease. Sister has headaches and a spinal curvature. Patient fell on a "stub" at the age of seven years and had his first seizure seven months after the accident. He has an aura consisting of a strange feeling; consciousness is seldom lost and amnesia for the

attack is not always complete. Seizure begins on the right side. Shows asymmetries about the head. Operation scar over right orbit. Autopsy showed thinning of the calvarium over the site of operation and *meningo-encephalitis and cortical atrophy beneath*.

An alcoholic father, a sister who may be neuropathic, and a probably infected trauma of the brain, made the prognosis of the case very doubtful. As will be shown, however, in such cases no operation may be as bad as the consequences of a poor one.

CASE II.—A30; aged at death, 22. Onset at 16, the supposed cause being a blow on the head. The face is asymmetrical. Autopsy showed an old trephine opening in the right parietal region; the brain shows well marked dilatation of the ventricles and some atrophy, especially about the island of Reil. The condition resembles cystic degeneration following injury. There was an old extravasation about the optic foramina.

The operation would naturally show neither the extravasation nor the atrophy, but, on the other hand, there were adhesions about the trephine opening which may have done harm.

CASE III.—A35. Patient submitted to operation about five years after the onset of symptoms, which were later diagnosed as due to tumor. The tumor proved to be inoperable and the patient died a few days after the operation. This case illustrates the necessity for early differential diagnosis and that intervention in tumor, to be effectual, should be early. In late operations little is accomplished beyond the good done by decompression.

CASE IV.—A53; aged at death, 40. Father had "fainting spells," and the paternal grandmother was epileptic; the mother suffered from severe headaches and tuberculosis. Patient began to go blind at 32. Was afterward operated upon in the left parietal region and "tumors" are said to have been removed. After this a right hemiplegia set in. There were incoordination, lateral nystagmus, loss of sphincter control. Death was due to cerebral hemorrhage and pneumonia. At autopsy, there were subcortical and sub-pial hemorrhages of the left temporal lobe. The infundibulum is greatly dilated, with two recesses causing pressure atrophy of the optic nerves, chiasm and tract. Patches in the cord, evidently of disseminated sclerosis. There was a large tumor mass filling the left ventricle; apparently it involves the septum lucidum and choroid plexus. The ventricles are dilated.

This case illustrates the contradiction between the history and the autopsy findings; there was no evidence of the removal of tumors from the cortex, and repair would seem hardly to be expected to be so complete.

CASE V.—A91; aged at death, 20. Father and two uncles died of tuberculosis. Dentition convulsions at 18 months. Left side most affected. Feeble minded. While confused and automatic, this patient fell down stairs and sustained a frac-

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ture of the skull. Operated, but death ensued. Autopsy showed extensive fracture of the skull, with operative enlargement of the crevices. There were softening foci and sub-dural hemorrhage in both frontal regions.

This case is included to show that cerebral trauma may occur *after* the onset of the epilepsy, so that were the bony flap of an osteoplastic flap trephine operation left off, there might result considerable danger to the patient from this unprotected brain area.

CASE VI.—A94; male; aged at death, 38. Onset at six weeks; microcephalic. Was in Buffalo State Hospital. Found dead. Autopsy shows *trephine opening about which all the membranes are adherent*. The right half of the brain is less congested than the left. Lateral ventricles contain some yellow fluid.

CASE VII.—A109; male; aged at death, 47. Father intemperate. Patient had his first convulsion at the age of 10, two weeks after a blow on the head with a pitchfork handle. Was trephined, and following this, the fits were as numerous, but possibly less severe. Patient had vertigo before seizures and headaches at various times. Sensory tests negative. Left knee jerk exaggerated and the left side of body is weaker than right, though the patient is right handed. Sways a little in walking and favors the left side. Progressive mental deterioration while at the Colony. Terminal event was preceded by a period of mental disturbances of increasing intensity. He rapidly failed and pulmonary congestion developed. One evening was found moribund. He showed a movement of the left lower extremity, consisting of a sudden slight flexion of the leg, repeated for a moment or two in quick succession. Death soon occurred. Autopsy showed trephine opening over left vertex, apparently interrupting the parieto-occipital suture. Skull is thin; dura adherent, especially about the trephine opening. The right cerebral hemisphere is larger than the left and the right temporal region is soft, yellowish and fluctuating. In this region there is a tumor (glioma) about the size of a hen's egg and also a collapsed cavity with a well-marked wall. Posterior portion of the left lateral ventricle was enlarged. Basal vessels sclerosed.

This case illustrates the incorrect location of the trephine opening. It is possible that the cyst may have been a residue from the old trauma, but this seems hardly probable.

CASE VIII.—A120; male; aged at death, 37. Onset at 19, a short time after yellow fever. A trauma to the head at an unknown date and three trephine operations. Aura consists of fear and a shadow on the left, together with a desire to turn in that direction. Had an hysterical attack. Was finally very much disturbed, sank into a stuporous condition and died. Autopsy shows trephine openings in right frontal and left occipital regions. Dura is thickened



CASE VIII.

under these openings and is adherent to brain. There is slight asymmetrical dilatation of the lateral cerebral ventricles.

CASE IX.—A139; male; aged at death, 48. Onset at 39. Was alcoholic from 15 to 42 years of age. Fracture of femur in or after seizure. Is deaf in left ear; has a right internal strabismus. Has difficulty in speech, and especially with vowels. Right side of face is weak. There



CASE IX.

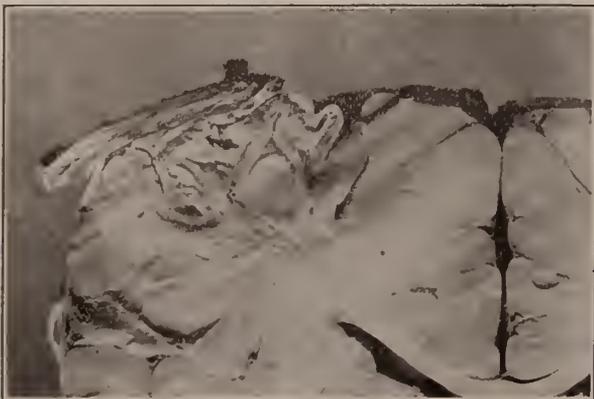
were some symptoms from about the appendix; a pneumonia developed, causing death. Autopsy shows the dura adherent over the surface of the frontal lobe, and the frontal convolutions narrow. Depression and small calcified spot at the upper end of the posterior central. Atheroma of the basilar artery. There is left cerebral hemiatrophy and atrophy of the convolutions on this side. There is marked invasion of the frontal regions below the adherent dura, by trabeculae of scar tissue, which penetrate the entire frontal lobe. There is some dilatation of the ventricles and a granular appearance of the choroids.

CASE X.—A152; male; aged at death, 17. Brother died in spasms at nine months of age. Onset at 18 months. When standing, tends to fall forward and to the right. Left side of face is smaller. Left extremities are very slightly smaller than right. Right talipes valgus, of slight degree. Tongue deviates to left. Associated movements of left hand when right is closed. Propulsive gait. Low grade idiot. Diarrhoea, cough and bronchitis; tuberculosis pulmonalis and lobar pneumonia caused death. Autopsy showed adherent dura along the sutures and there was a trephine opening. There was a sharp spicule of bone in the dura.

It would seem that operation in such a case was foolish, since the mental grade of the patient was very low and the onset of the epilepsy at a very early age.

CASE XI.—A245; male; aged at death, 16. The father was intemperate. Patient shows slight facial asymmetry and atypical ears. Is a left hemiplegic. Developed pulmonary tuberculosis; died from serial seizures. History contains no mention of an operation. Autopsy showed a trephine opening; moderate hydrops meningeus; Leptomeninges much clouded. Pattern of convolutions asymmetrical. Well-marked dilatation of both the anterior and posterior portions of the lateral ventricles.

CASE XII.—A277; male; aged at death, 29. Several members of the family were tubercular. Patient sustained a penetrating wound of the



CASE XII.

left parietal region at eight and epilepsy set in at 12. Two operations were done in this region, the second being undertaken on account of pain and headache at the site of the former. Autopsy showed the meninges adherent to the cortex, in the region of the operation; the cortex here was extremely atrophic. In the thick scar tissue over this region there could be seen the gold foil inserted at the last operation to prevent adhesions.

While we have not the date of the first operation, it seems probable that had the intervention been prompt, and done with proper technique, the atrophy and adhesions for which the second operation was undertaken would have been prevented. The second operation naturally could not correct the damage already done.

CASE XIII.—A285; male; aged at death, 47. Maternal grandmother epileptic. Onset in this patient at 15. The patient shows facial asymmetry, torus palatinus and atypical ears. Has been trephined over the left motor region. Had "scrofula" of the left eye; enucleation. The terminal event was status epilepticus, with grand mal attacks, as well as convulsive movements of left side of face, left arm and forearm. The autopsy showed the trephine opening and recent pachymeningitis interna hemorrhagica.

CASE XIV.—A303. The skull cap in this case showed at autopsy very thin and presented an area resembling a repaired trephine opening and which is crossed by a groove for the middle meningeal artery. Internal hydrocephalus.

Mention is made of this case because of this pseudo-trephine opening. The case history contains no mention of an operation—a not uncommon fact, even where the anatomical evidence is positive—and were it not that the artery crosses the suspicious area in a groove, it would have appeared that an operation had been done and forgotten by the patient's relatives.

CASE XV.—A330; male; aged at death, 22. At the age of 18 months was noticed to be mentally and physically weak. Sustained a fall at six years of age. At 17 years of age sustained a fracture of the skull. Was operated upon three years later. Seizures began at 19 years of age. The patient became demented. Autopsy showed an osteoplastic flap, partly in position, but movable, and a line of fracture which had not been followed up. The dura was adherent to the bone, but not to the arachnoid, and the silk sutures used in closing the dura were still visible. There was softening on the inferior surface of the right frontal lobe.

This case illustrates several possibilities—that the injuries to the brain may be remote from the site of the injury; that wounds of the dura close completely; and it is also worth considering whether the fall at 17, in which the fracture was sustained, was not really due to a seizure.

CASE XVI.—A333; male; aged at death, 47. Maternal aunt and uncle insane. Patient is said

to have fallen and sustained a fracture of the skull at 20-23 years of age. Onset of the epilepsy at 34. At autopsy, the trephine opening was shown to be at the site for the ligation of the middle meningeal artery. There were no adhesions to the cortex.

CASE XVII.—A341; male; aged at death, 17. This patient was puny as a baby and had convulsions at dentition. Was operated upon at 14 years of age and is now paralyzed on the left side. Is a middle grade idiot. Autopsy showed a trephine opening crossed by the middle meningeal artery. There were adhesions of the cortex, leptomeninges and dura. There was slight left temporal atrophy and moderate dilatation of the lateral cerebral ventricles.

CASE XVIII.—A364; male; aged at death, 54. Patient was injured by a falling tree at 33. This was followed by seizures and an operation was done, of which we have no details. Autopsy showed a depressed opening, with adhesions to the cortex and meninges. On section, underneath these adhesions there is extensive destruction of the brain substance, communicating with the lateral ventricle. The surface indications do not indicate the degree of the destruction.



CASE XVIII.

CASE XIX.—A392; male; aged at death, 42. Father is said to have been fairly temperate; otherwise the family history appears negative. The patient apparently was normal up till the age of 13, when he received a bullet wound of the head; mention is made of fracture of the skull at this time and with sloughing of the wound following, with the result that there is a large depressed scar in the right upper forehead. Patient had an initial lesion at 34, although exposure was denied. At 36, patient had a stroke, which involved the entire left side, even causing blindness in the left eye; recovery from this was incomplete. Onset of the epilepsy variously stated as at 20 (admission paper) and at 37 (patient's statement). The left side is most

and first affected; this side is usually weak after a seizure, but there is no history of an exhaustion paralysis. There was facial asymmetry. Wassermann reaction was weakly positive. Died of exhaustion following seizures. The autopsy shows an irregular opening in the upper part of the right frontal bone, under which there are adhesions. There was an exostosis at the margin of the opening and another lower down in the temporal region. There was also an osteoma in the falx. The cortex under the opening was very thin and membranous, and the frontal region collapses. There is also a membranous spot on the inferior surface of the right temporal lobe. On section, these defects are confirmed.

We see in this case the very extensive destruction which probably followed the bullet wound. The cystic condition of the temporal region is difficult to explain, unless it is related to the paralytic stroke a few years ago. The clear-cut history of traumatism might have tempted a surgeon to operate, in spite of the additional history of syphilis. However, autopsy showed that the cerebral destruction was so extensive as to render any intervention hopeless.

The object of operative intervention in all cases of epilepsy is to remove a source of irritation or else to reduce intracranial tension, either through simple decompression or through a combination of the latter with drainage. In either case, a favorable result can only be expected in those cases in which the surgical procedure results in a minimum production of scar tissue. It cannot be too strongly emphasized that the substitution of scar tissue for a previously existing pathological condition or in the course of a drainage or decompression operation may more than counterbalance the good which might have been produced by the operation, without scar-tissue formation.

With this fundamental concept in mind, we may consider the various types of operations, which fall more or less accurately into the following groups:

- (a) Traumatic cases, including birth traumas and typical Jacksonian cases.
- (b) Brain tumors.
- (c) Cases not distinctly Jacksonian, but in which seizures with loss or impairment of consciousness have focal characters so definite as to suggest localized pathological change.
- (d) Decompression and drainage operations.

In traumatic cases, the time to operate is before the onset of the epilepsy; in any head injury, where irritation or compression symptoms are apparent, the surgeon should not hesitate to open the cranium and do what he can to restore things to their normal state. He may do this with equanimity, since the results in cases not operated upon are quite as bad as in some in which operation was done. The scar of the operation may be no worse than the results of clot and depressed bone left to organize. The

brain will not, however, stand careless or rough handling; the writer recalls an account of an operator who thrust his finger through the cortex into the lateral ventricle as an exploratory procedure. One cannot wonder that brain surgery is at times unsuccessful if such practices are ever indulged in. We must not add to the injury and must endeavor to secure a repair which shall not be in itself irritating; the opening in the bone must be firmly filled with the replaced flap, or at least with a dense fibrous membrane of scar tissue. This must not, however, pass the dura and between dura and leptomeninges we must find no adhesions. A review of the cases presented here shows that in some this object was attained, while in others there was dismal failure from this standpoint; wherein lies the difference? Our case histories give practically no data as to the technique of the operations, but as a basis for discussion the writer would suggest that in the unsuccessful cases, *i.e.*, with adhesions formed, the sub-dural space was not properly evacuated, or drained of exudate, or that injury was done to the membranes during the operation. Naturally, with exudate remaining or forming after an operation, adhesions are to be expected. In some cases, the dura was probably not opened, the removal of exudates between the dura and bone satisfying the surgeon. It is only fair to say that the operations of later date seem, on the whole, better done and to have better results.

In traumatic cases, the prognosis as to the curative result of operation must be guarded. Sometimes the damage within the brain is out of all proportion to the surface appearances; not only is this true in a gross way, as illustrated by some of the photographs submitted herewith, but the effects of the concussion in causing a disintegration in the finer structures—a change not necessarily visible to the naked eye; sub-cortical hemorrhages are also of importance in this connection and the possibility of conditions remote from the site of injury must be borne in mind. These naturally are impossible of removal by an operation.

Our cases illustrate the necessity for prompt intervention. As has been said, the time to operate for traumatic epilepsy is before the onset of the disease and the surgeon must remember that while he is delaying, the compression from exudate or depressed bone is producing changes in the underlying cortex which speedily become chronic.

As regards brain tumor, while the condition possibly does not strictly belong with the epilepsies, yet epileptiform seizures are so prominent features of many cases that it must not be overlooked. As one well known neurologist recently remarked, the overlooking of a case of epilepsy from brain tumor is almost inexcusable. The operability of the tumor is a different matter and lies beyond the scope of this discussion. Early

operation is to be insisted on, if the tumor seems to be accessible and decompression gives relief in the later stages.

The remarks upon the traumatic and tumor cases apply to the true Jacksonian seizures absolutely; in these there is a localized motor exhibition, without change of consciousness. We frequently find patients subjected to operation in whom the focality of origin or march of a convulsion suggests a local cortical lesion. These cases practically all have typical grand mal convulsions, at least as regards loss of consciousness.

The examination of a considerable number of brains at autopsy has shown a surprising lack of cortical conditions, which could have been removed by the surgeon's knife. Out of about 375 brains examined at the Colony, only a very few showed anything which might have been treated by excision; this is, of course, exclusive of tumors. These few cases were, however, by no means the only cases in which a definite march of convulsion was observed. It is probable that focality at the outset of grand mal seizures, *i.e.*, seizures in which consciousness is seriously impaired or lost, as contrasted with the purely motor attacks of Jacksonian epilepsy, is only an indication of which group of cortical cells is the most sensitive to the epileptogenous agent. The excision of such a group leaves a focus of repair and a border of tissue which has been injured, and these may constitute a new focus of irritation. Therefore, the writer would earnestly urge that operations undertaken on account of the apparent focality of grand mal attacks be only done after the most serious consideration.

Autopsy findings possibly also cast some light on the applicability of decompression and drainage operations in epilepsy. So far as decompression alone is concerned, there are rarely evidences of increased intracranial tension, except, of course, in tumor cases; there is rarely flattening of the convolutions. Similarly, from a clinical standpoint, there is evidence of only slight increases of intracranial tension. We do find post-mortem, however, invariably some, and often quite a good deal of fluid under the arachnoid or between it and the dura. Along with this there is also meningeal clouding and thickening and dilatation of the lateral cerebral ventricles.

We sometimes inject formalin into the cranial cavities of bodies as a preservative, and in doing this find that there is a marked flow of cerebro-spinal fluid as soon as the stylet is withdrawn from the trocar (naturally, this is before the formalin solution has been injected), which far exceeds in rate the normal flow; so that one has reason to believe that after death at least there are moderate increases of intracranial pressure in epileptics. Whether these have any meaning in the matter of increased tension is an open question.

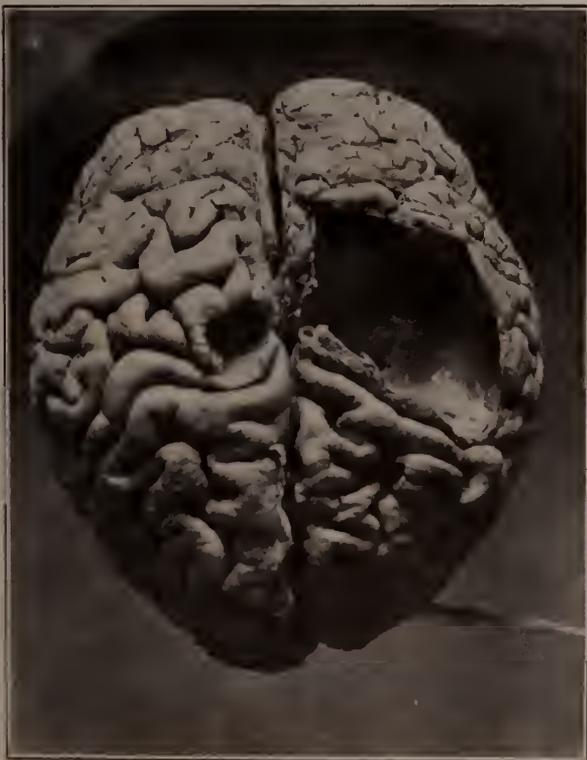
Operations for decompression and for drainage are commonly followed by some improvement, but so, for that matter, are many procedures which may be done on the epileptic. I have a dim recollection of a report of a case in which the removal of wax from the ears caused the improvement or cure of the case.

It would seem, however, that the decompression was unwise in the epileptic because if the maximum benefits are to be obtained, the osteoplastic flap must be left off, with a consequent danger of injury to the brain during attacks. With a drainage operation, fenestrations of the dura, for which Alexander claims such excellent results, the same objections hold, and in addition, the drainage is only a temporary matter, since the incisions in the dura close after a time. It may be remarked that at autopsy we have never seen any of the localized arachnoidal edemas mentioned by Alexander. While edemas were common, they were always extensive.

There is a group of traumatic cases which has not been generally considered in connection with epilepsy, but which has attracted attention of late through the proposal of Cushing two or three years ago to treat them surgically. I refer to the birth injuries. The mortality of such operations undertaken promptly after birth was high—50 per cent. Since this early work, the proposition has been more or less discredited on account of the fact that the lesions of a birth trauma are apt to be multiple and, at least in part, out of the reach of the surgeon's knife.



RESULT OF BIRTH TRAUMA.



RESULT OF BIRTH TRAUMA.

While these facts are true, the writer would urge the careful weighing of such operations in suitable cases. When we look on the idiots, imbeciles, epileptics and hemiplegics who are the direct result of birth traumas, it would seem that even if we saved only an occasional one from their otherwise certain fate, we were doing something worthy of approval.

The cases I have cited above from our records at the Colony have been operated upon and have nevertheless died epileptic. In some cases, the scar tissue formation has been the evident cause of continued irritation and in others there was cerebral destruction, which was sufficient to cause the attack, but in others there was apparently both a successful operation and an absence of lesion. Why, then, the ill success?

The writer has frequently expressed his idea of the origin of epilepsy as an equation in which the sum of a varying number of known, unknown and variable quantities is placed equal to the seizure, *i.e.*, causes the seizure. It would appear from this that the etiology of any case was a summation, and therefore unless one of the etiological quantities was decidedly greater than the others, the treatment of any one of them would not cure the case. The writer believes that this is true. In looking over the cases which have been made the subjects of operation, we

find, for example, a decided neuropathic taint in many of the family histories, and if we are to accept this as an important etiological quantity, we must admit that we cannot hope to excise it, along with some focal lesion, or drain it away by a drainage and decompression operation. Similarly, we find some of our patients who desire operation have alcoholism or venereal excesses as part of their etiological equation. There again the knife is handicapped. In some of the traumatic cases the trauma is not the cause, but is the result, of the first seizure, and therefore the operation is of secondary importance.

I think you will agree with me that we need better and more extended diagnosis and weighing of the histories of our cases before approving surgical intervention, and that the surgeon must look to his technique, lest the results of his manipulation be worse than the original condition.

INDICATIONS FOR SURGICAL INTERVENTION IN EPILEPSY.*

By EDWARD A. SHARP, M.D.,
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EPILEPSY is merely a syndrome occurring in a number of different pathological conditions, but as such it usually predominates the clinical picture and so is frequently considered a clinical entity.

Souques,¹ Starr² and others deny the existence of an essential or idiopathic epilepsy, *i. e.*, epilepsy as a pure constitutional psycho-neurosis without appreciable lesions; and this appears to express the facts in the vast majority of the cases.

While we are not, with the present methods of examination of the central nervous system, able to determine the essential pathology of many of the cases of epilepsy, there can be but little doubt that some definite lesion exists and that the so-called idiopathic epilepsy owes its origin to molecular, chemical or other changes not yet determined. On the other hand, epilepsy is a frequent occurrence in a number of gross, easily demonstrable pathological conditions, some of which may be attacked surgically. The value of any operation for the relief of the epilepsy will depend on how much influence the condition in question exerts as an etiological factor; the length of time it has existed; the damage to the nervous structures produced by the lesion; and the possibility of removing the exciting cause.

First in importance among the conditions where surgical intervention is indicated are those cases of focal or Jacksonian epilepsy of traumatic origin where a definite relationship can be established between the trauma and the

onset of the convulsions. The earlier the convulsions appear after the trauma, and especially if the injury has been of a nature to produce fracture of the skull with direct irritation over the motor area by displaced bone or hemorrhage, but without permanent damage to the nervous structures, the more favorable are the results to be expected from operative intervention.

When epilepsy develops years after a head injury it is more difficult to determine the influence the trauma had in the production of the attacks. Even if the attacks are Jacksonian in character, indicating a focal lesion, the results of operation are less favorable than the early cases, although the operation is none the less indicated.

Deeply seated or diffused lesions in the brain may occur from severe head injuries and may produce epilepsy at once or at a future time by irritation of the cortex through the general disturbance of the intracranial pressure. When the attacks are generalized from the beginning, and do not show the focal characters, craniectomy usually fails to disclose any tangible lesion, and, except for the occasional benefits derived from the decompression, the operation accomplishes nothing.

Many active children receive some injury to the head, but if one of these children later develops epilepsy it is not unusual to attribute such an injury as the cause. Any injury to the head may be an exciting cause of epilepsy in a susceptible person, but the majority of children who receive trivial, or even severe head injuries, never develop epilepsy. Ziehen³ states that epilepsy develops in at least 10 per cent. of all severe head injuries.

When a definite injury to the head has been sustained, if of such a nature that fracture or hemorrhage is suspected, it is better to operate at once and remove clots, depressed bone, etc., before the irritation leads to epilepsy; for unfortunately, the convulsions once started may persist as confirmed epilepsy even after removal of the exciting cause.

When epilepsy has already developed as a result of trauma to the head a single operation may produce arrest of the attacks. In some cases where the attacks have ceased for a year or two following the operation and then return, it has been the custom with some surgeons to trephine again. Legrain⁴ reports one instance where eleven operations had been performed on one patient, with temporary benefit following most of them. My own observation is that if the first operation, with a fair amount of decompression, does not produce relief it is useless to repeat the surgical measures. Sicard⁵ advises re-operation in the cases where the first trephine opening has been small and the cerebral pulse cannot be felt through the bone defect.

In some cases there has been no immediate

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

improvement resulting from the operation, but the patient has been put in a more favorable condition for the regular hygienic, dietetic and medical treatment, and the end results have justified the operation.

Epileptics stand surgical operations very well and it is the usual experience to see temporary improvement, in the number and severity of the attacks, after any operation, whether on the head or other parts of the body. This is quite as likely due to the special care and nursing during convalescence as to any effect of the operation itself.

Out of the total number of 3,502 patients admitted to the Craig Colony for Epileptics, 48 had been trephined either before admission or during their treatment at the Colony. In a few of these the operation had been repeated. Naturally, none of the cases operated on at the Craig Colony have been trephined immediately after a trauma or the onset of the epilepsy, as they were all confirmed epileptics at the time of admission. The results of operation on these patients cannot be compared with those obtained by operation immediately after the trauma or in the early stages of the epilepsy.

None of the cases trephined at the Colony have been permanently relieved from the attacks although most of them were benefited, at least temporarily, by the operation. In several of the cases operated on before admission the condition of the patient had been made worse by the operation, as was stated in the histories at the time of admission. In some of these cases the relationship to trauma or focal irritation was very remote or questionable; the slight trauma to which they were attributed acting merely as an exciting cause in a susceptible individual. Some of the trephined cases were done for conditions other than traumatism.

Convulsions following encephalitis or meningitis may be considered as epilepsy due to gross brain lesions. Operation is indicated in those cases where a Jacksonian type of seizure suggests a focal lesion. Unfortunately for the operative results such a lesion may not be limited to the Rolandic region nor even situated in this area, but in one of the surrounding lobes or deeper structures and produces the convulsions by irritation of the motor area. As a general rule, the more a convulsion is limited to one extremity or part of an extremity, the more localized is liable to be the cortical irritation and the greater the chances for arrest of the seizures by removing this focus. Horsly⁶ believes that every case of localized epilepsy that is not of unquestionable idiopathic origin should be treated by exploratory operation. Muskens⁷ has recently reported excellent results obtained by operation in cases of epilepsy due to serous meningitis.

Intracranial neoplasms may produce convulsions by direct irritation of the motor cortex or

by irritation of this area through the increased tension associated with the tumor growth. When accessible the tumor should be removed, but in some cases where this cannot be done the convulsions have ceased after a decompression operation and have not returned during the subsequent progress of the tumor growth.

Dr. J. F. Munson, pathologist at the Craig Colony, has recently called my attention to the surprisingly large number of brains which, at autopsy, show some dilatation of the lateral ventricles. In nearly all the specimens which I examined in his laboratory this distension was present to a noticeable degree. Undoubtedly this is a secondary process, as all these brains showed some definite lesion. The question naturally arises as to what would have been the result of decompression in some of these cases which clinically showed no focal signs. Kotzenberg⁸ thinks the cerebral decompression resulting from the trephining has produced the favorable influences in some of the so-called idiopathic cases which he has operated on. On this basis it might appear rational to extend the indications for decompression to some of the more severe cases without focal symptoms which have not been benefited by other lines of treatment.

Epilepsy associated with infantile cerebral palsy is not as a rule amenable to surgical treatment; although most of these cases have a unilateral order of invasion of the attack commencing on the paralyzed side.

This condition is brought about by a variety of pathological processes, some of which occur before birth, some at birth and others during early life. Among such conditions may be mentioned cerebral and meningeal hemorrhages; encephalitis; the various forms of meningitis; thrombosis and embolism. These result in pencephaly, cysts, thickened meninges, cortical sclerosis or softening, and they produce such profound changes in the developing brain that operation can accomplish very little years afterward when the pyramidal tracts are degenerated, or have not developed, and epilepsy is present.

Over 10 per cent. of the cases admitted to the Craig Colony owe the origin of their epilepsy to these causes producing infantile cerebral palsy, and they are among the most intractable of all the epilepsies. There were 443 hemiplegics in the 3,502 admissions.

In most of the hemiplegic cases the lesion is beyond surgical reach, or, if accessible, it would be useless to attempt removal of it. In a certain few of the cases a localized cortical cyst or meningeal thickening can be removed and this may produce some improvement in the epilepsy.

When contractures are present it indicates secondary lesions in the pyramidal tracts and removal of the cortical lesion will not correct the deformity. Cases showing athetoid move-

ments in the hemiplegic extremity usually indicates a deeply seated lesion which is beyond surgical reach.

Many of the infantile cases are caused by hemorrhages at birth; and Cushing⁹ has demonstrated that craniectomy can be successfully performed on the new-born and these clots removed. The serious consequences which result from leaving these clots to exert pressure and atrophy of the developing brain should justify operation in every case where the indications point to meningeal or sub-dural hemorrhages at birth.

While the mortality, from such operations on the new-born, has been high, it must be remembered that many of these infants would not live anyway, and those who do rarely become useful citizens. If by early operation we can prevent the paralyzes, epilepsies and other disastrous consequences resulting from hemorrhages at birth, we should not be deterred by any consideration of the high mortality from operating on such infants. The surgery of epilepsy must be preventative rather than curative.

The influence of various reflex irritations such as eye-strain, nasal polypi, sensitive scars, uterine or ovarian disturbances, etc., must be considered only as exciting causes in predisposed or susceptible persons.

This predisposition may be brought about by one or more of the above mentioned encephalopathies occurring in early life; but it is frequently an irritable or unstable nervous system resulting from defective strains in the ancestry. The cases where peripheral reflex irritation alone is the only factor in the production of epilepsy must be very few and it is doubtful if such a condition exists. The more carefully and thoroughly we are able to investigate the antecedents of the epileptic patient, in regard to nervous and mental diseases, alcoholism, etc., the more strongly are we convinced that a neuropathic heredity plays a very important role and that the various reflex irritations act only as exciting causes, if they have any influence.

Many of these reflex irritations would be annoying to an otherwise healthy person and they cannot fail to exert an unfavorable influence on one with a marked neuropathic constitution.

The practical results obtained by correcting these peripheral irritations have occasionally been very encouraging, amounting in some cases to prolonged cessation of the attacks, or practically a cure. Unfortunately the majority of the cases do not show such favorable results, and the correction of a supposed reflex irritation may not modify the attacks, but the irritation should be removed whenever possible.

One of the Craig Colony cases, a female patient, aged 37 years at time of admission, with a neurotic family and personal history, had a

cystic uterus and imperforate cervix. Vicarious hemorrhages in the iliac regions occurred at the menstrual periods; a great increase in the number of the convulsions also occurring at these times.

In April, 1900, the uterus, ovaries and tubes were removed. There were no attacks following the operation and the patient returned home four months later. A letter received from the family physician in January of this year (1912) states that the patient has remained free from attacks and in perfect health since the operation—a period of twelve years.

In this case we have removed a source of reflex irritation which was apparently an inciting agent for the attacks, but we have not removed the neuropathic taint. This still persists and may again be subject to convulsive explosions if given a suitable exciting cause. On the other hand, the freedom from this irritation and the absence of the attacks may result in establishing sufficient stability that the ordinary forms of reflex irritation will be ineffective as exciting causes.

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REVIEW OF SIX CASES OF HEREDITARY CHOREA.*

By EVELINE P. BALLENTINE, M.D.,
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THE following letter by Dr. C. O. Waters is from *Dunglison's Practice of Medicine*, published in 1842:

"Franklin, N. York, 5th May, 1841.
"Prof. R. Dunglison.

"Dear Sir:—In obedience to your kind request I improve my first leisure since my return home, in giving you, in as lucid and satisfactory a manner as possible, an account of a singular affection somewhat common in the south-eastern portion of this state, and known among the common people as 'the megrums.' Whence the name originated I know not, but if it be a corruption of the word 'megrin,' I am at loss to understand how it ever came to be applied by the vulgar to the disease of which I am speaking, and which has nothing in it analogous to ordinary hemiplegia or megrim. It consists essentially in a spasmodic action of all, or nearly all, the voluntary muscles of the system—of involuntary and more or less irregular motions of the extremities, face and trunk. In these involuntary movements the upper part of the air passages occasionally

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

participate, as is witnessed by the 'clucking' sound in the neighborhood of the glottis, and in a manifest impediment to the powers of speech. The expression of countenance, and general appearance of the patient, are very much such as are described as characteristic of chorea.

"The disease is markedly hereditary, and is most common among the lower classes, though cases of it are not unfrequently found among those, who by industry and temperance have raised themselves to a respectable rank in society. These involuntary movements of the face, neck, extremities and body cease entirely during sleep.

"This singular disease rarely—very rarely indeed—makes its appearance before adult life; and attacks after forty-five years of age are very rare. When once it has appeared, however, it clings to its suffering victim with unrelenting tenacity till death comes to his relief. It very rarely or never ceases while life lasts.

"The first indications of its approach are spasmodic twitchings of the extremities—generally of the fingers—which gradually extend and involve all the voluntary muscles. This derangement of muscular action is by no means uniform; in some it exists to a greater, in others to a less extent, but in all cases it gradually induces a state of more or less perfect dementia.

"This disease, in its origin and progress, is not, as far as I have been able to discover, attended with any unusual pain in the head. In some of the worst cases I ever saw, I could not discover that there had ever been any unusual sensation in the cerebral region.

"When speaking of the manifestly hereditary nature of the disease, I should perhaps have remarked that I have never known it to occur in a patient one or both of whose ancestors were not, within the third generation at farthest, the subjects of this distressing malady.

"The appetite is commonly good, and the process of digestion seems generally to proceed with considerable regularity. The bowles are, however, usually somewhat costive, though I have known cases in which daily evacuations were not unfrequent. Of the general appearance of these evacuations I am not informed.

"It may not be amiss to state that the last patient who came under my observation, and who had the reputation of being an honest man, informed me that, in his own case, this involuntary action of the muscles ceased under the influence of all instrumental music, except that of the common 'Jew's-Harp.' I very much regret it was not in my power to test the truth of this statement.

"I have thus, dear sir, given you a general—though perhaps not very lucid and satisfactory—account of this malady. I may observe that, although the descriptions of chorea in the books apply very well to this disease, it nevertheless seems to differ in several respects from ordinary chorea. 1st. It rarely occurs before adult age.

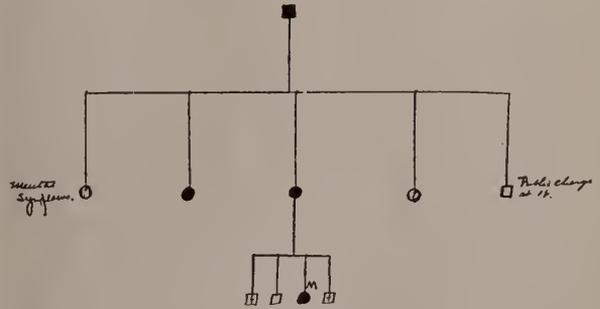
2nd. It never ceases spontaneously. 3rd. When fully developed it wants the paroxysmal character.

"I am, dear sir, respectfully,
"Your ob't serv't,
"C. O. WATERS."

Not much has been added to our knowledge of hereditary chorea during the seventy years that have elapsed since the above letter was written. The observations since then have confirmed the findings of Waters in 1842, *viz.*, the syndrome characterized by marked heredity, onset of choreic symptoms during adult life, mental derangement, the progressive slow development of the disease, no treatment of any avail, cause unknown.

The most constant pathological findings in the brain are shrinkage changes, profound pigment alterations and poor stainability.

The study of the cases reported confirm in general the findings of other observers. Only the more unusual or exceptional phenomena of the cases will be referred to in detail. The charts show the heredity of the cases. The choreic cases are solid black. The square indicates male and the circle female.



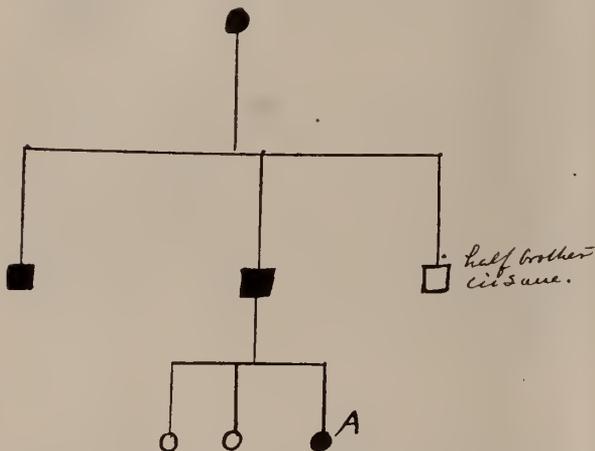
No. 1.—Legend. ○, female; □, male; |● or ■, hereditary chorea; Form of psychosis not known. †, Died in childhood or infancy.

Case No. 2432—Chart I.—M. W.—case indicated by M. Admitted in last stages of the disease. Maternal grandfather and mother were choreic and one maternal aunt had mental symptoms. Symptoms developed when about twenty-five years of age, course was rapid, duration only six years, the patient dying at thirty-one years of age. The mental symptoms were those of marked depression with suicidal tendencies. Deterioration was not marked; three weeks before death had good grasp.

The pathological findings were: General shrinkage alterations, general pigmented cellular changes of a moderate degree, some increase of the lymphoid cells of the pia and some pigment; moderate increase of nuclei in the first layer of the cortex, general increase of satellitic cells and cells of same type about blood vessels of the cortex.

Case No. 2459—Chart II.—A. B.—indicated by A. Paternal grandmother was choreic. Father and paternal uncle were born in Germany,

were choreic and patients in the Rochester State Hospital. Onset of Case "A" at thirty years, duration was ten years. On admission choreic movements were very slight and only occasionally observed, but the mental symptoms were pronounced. The choreic symptoms on admission consisted of occasional grimaces and occasional jerking of the right leg and arm. The mental symptoms were those of great irritability. Patient was quarrelsome, assaultive and suicidal. She expressed delusions of persecution. She died of exhaustion, being clear sensorially and having a good grasp up to a few days preceding her death.

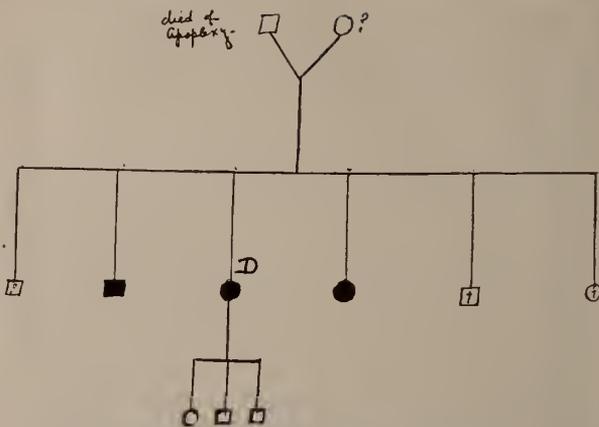


No. II.—Legend. ○, female; □, male; ●, hereditary chorea; ■, hereditary chorea; †, neurotic; ?, Probably incipient chorea.

Case No. 4063—Chart III.—indicated by *D*. Age at onset unknown, probably thirty-five; duration ten years or more. Choreic symptoms marked when admitted. Mental symptoms were unique in that there was no depression. She was frequently elated, expressed expansive delusions; at times delusions of a persecutory trend. A few days before death complained of pain in head. Autopsy showed gross changes in brain. There was a large amount of cerebral fluid—250 c.c. Weight of brain—950 grams. There was considerable thickening of the membranes and marked shrinking of frontal and parietal convolutions.

Little was known of the history of this patient on admission, but it was reported that one sister was choreic. After the patient's death a brother reported at the hospital in response to a message and it was noted that he was in an advanced stage of the disease.

About twelve years ago the writer became interested in the account of a small lad, ten years of age, who was suffering from some neurosis and who belonged to the fifth generation of a family that had a history of hereditary chorea—case marked "H"—Chart IV. At that time it was learned that the maternal grandfather was intemperate, that three great aunts were choreic and that his great grandfather and great grandmother were choreic. Chart was begun twelve

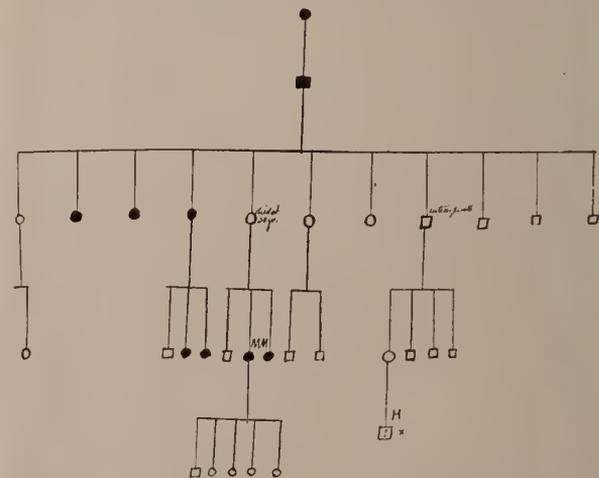


No. III.—Legend. ○, female; □, male; ●, female, hereditary chorea; ■, male, hereditary chorea; †, died in infancy; ?, history unknown; †, children under 13 years.

years ago. "H" died at age of twenty and was bedridden for many years preceding death.

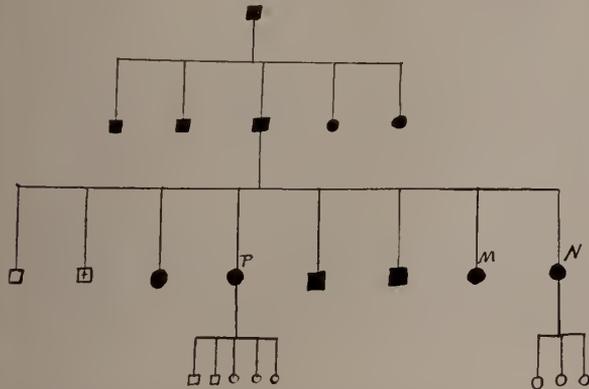
Case No. 5654—M. M.—Chart IV. During the last year a member of this family group came under the writer's care. Mrs. M. was seventy-three years of age; had suffered an apoplexy when fifty-three years of age; the choreic symptoms had appeared soon afterwards and slowly developed. Besides the cases already cited as belonging to this group, it was learned that this patient had one own sister who died of chorea and two half-sisters who are choreic. The mental symptoms in this case were somewhat variable; at times she was depressed, but frequently she became restless and excited and did not have a good grasp on her surroundings, the delirium resembling a senile delirium. She died suddenly of an apoplexy.

Chart V. is remarkable in that it shows in a family consisting of five brothers and sisters all suffered from chronic chorea and of eight brothers and sisters of the third generation, six



No. IV.—Legend. ■, male, hereditary chorea; ●, female, hereditary chorea; ?, neurosis, died at 20 years; (b) intemperate; (a) died at 35 years of age; †, youngest over 30 years.

of the seven that reached adult life had chorea. Three sisters of the third generation have come under the writer's observation. The cases marked "P" and "M" were patients in the Rochester State Hospital. The one marked "N" was formerly at King's Park State Hospital, at present is in a home for incurables in Brooklyn. The neurosis developed in the latter when about thirty years of age and has continued for about nine years.



No. V.—Legend. ●, female, hereditary chorea; ■, male, hereditary chorea; †, died in infancy.

Case No. 1872—P. P. Onset of attack was at thirty-six years of age and duration was twelve years. On admission physical symptoms were marked; there was little deterioration and little depression.

Case No. 2720—M. P. Age at onset thirty-five years. This case was most interesting and instructive because patient was under frequent observation at the very incipiency of the attack; Miss P. came frequently to the hospital, previous to her commitment, to visit her sister. Patient suicided soon after the development of beginning choreic symptoms. The findings of the brain at autopsy were specially interesting on account of the disease being in its incipiency, having continued less than a year.

This patient was of a peculiar make-up, a fair scholar, intelligent and capable. Although an excellent cook and housekeeper, she did not remain long in one place on account of great irritability of temper, flying into frequent rages or tantrums; however, she was affectionate toward her relatives and friends, making many sacrifices for them. Most of the time she was pleasant, agreeable and friendly.

On admission she was in a rather poor general physical condition. She complained that "I feel dizzy in my legs" and "I feel as though I walked like a drunken person." Also stated that she was somewhat incapacitated for work because at times her hand would jerk and that she was awkward for the finer movements with her hands. Objectively all that was observed was that occasionally the index fingers of both hands would make excursions from the median line and the toes of the right foot would jerk. Dur-

ing the two months following admission, under rest and freedom from worry Miss P. improved physically; choreic symptoms did not apparently increase. At times she was irritable and fault-finding and would exhibit considerable temper; she complained of feeling "trembly." When speaking of her future was at times despondent. Suicided during one of her tantrums.

The summing of the report of the anatomical features is as follows:

"It will be seen that the changes in this case correspond rather closely in shrinkage, changes, pigment alterations and poor stainability" to that of "W"—Chart No. I—xx. "Some of the vessels are slightly thickened x x x. The pia x x x contains rather more pigment than in "W" x x x. The subcortical vessels show more pigment and probably more is collected about the neuroglia nuclei."

AN ELABORATION OF A PREVIOUSLY REPORTED DEATH WHILE USING NITROUS OXIDE AND OXYGEN AS AN ANÆSTHETIC.

By PALUEL J. FLAGG, M.D.,
YONKERS.

IN a paper read before the Westchester County Medical Society, January 16, 1912, and published in the NEW YORK STATE JOURNAL OF MEDICINE for April, a series of one hundred cases of nitrous oxide oxygen anæsthesia were reported. Case No. 77 is reported to have died. Space did not permit of a detailed report of this case, but as deaths on the table while using nitrous oxide oxygen as an anæsthetic are of importance and interest at the present time, this report perhaps deserves more than a passing notice.

It is an open question as to whether or not this death occurred as the result of the use of nitrous oxide oxygen ether as an anæsthetic. The reader may judge for himself from the following facts:

Patient, a large, fleshy colored woman, aged 25. She had been bleeding almost continuously for a period of four or five months. Two years ago her right tube and ovary were removed. Before the operation a tentative diagnosis of uterine fibroid was made. The enlargement upon the body of the uterus which gave rise to this diagnosis proved later to be occasioned by adhesions about the proximal end of the tube, which had been tied off by a heavy silk ligature. No fibroid of the uterus or appendages could be found.

The patient was reported to have had an attack of syncope shortly before the operation. About twenty minutes before being anæsthetized she received 1-4 gr. morphine and 1-150 gr. atropine hypodermically. When she entered the operating room she was in a very nervous frame of mind. The examination of her heart had been negative. The apex beat, however, was

heaving and forceful. Anæsthesia was induced at 4 P. M. The patient went under quietly. As there was evidence of shallowness in her anæsthetic state ether was given to the extent of about one dram. Shortly after this the respirations were obstructed by masseteric spasm. The cervix was dilated and the uterus curetted. The respirations were then irregular and obstructed. The operator made the remark that the blood looked dark (the black skin made it difficult to properly judge the normal color). The ether and gas were stopped and a large proportion of oxygen was given. The patient was replaced in the dorsal position and the breathing immediately improved. When the abdominal incision was made the tissues looked extremely anemic. Moderate muscular relaxation was present. The pulse was of good quality but variable, rapidity about 120. The corneal reflex was active and the pupils were contracted. During the course of the operation (which occupied 1.17 from the induction to the cessation of the respiration), the breathing was irregular, slowing to from three to four a minute and then increasing in rapidity. While the abdominal work was being done it was thought that this condition was due to pulling upon the viscera, there being an absence of signs of deep anæsthesia. Toward the end of the operation the cheeks and forehead became cold, as though the patient was suffering from shock. This condition was not warranted by the nature of the operation or the loss of blood. The mask was removed several times from the face and the patient rapidly came out. When the mask was replaced a large proportion of oxygen was given. Several times the corneal reflex was lost, to reappear again almost immediately. The breathing improved as the operation was concluded. When the patient was raised from the Trendelenberg it improved markedly. At this time the operator said: "She is pretty rigid." As the patient had been behaving badly no ether was given her, but oxygen instead, in the hope that the rigidity was of an asphyxial nature. While the old scar in the skin was being cut out the patient showed the effects of peripheral stimulation by breathing more deeply and more rapidly. The corneal reflex was active and the pupils were contracted. Suddenly irregular breathing, simulating that which had frequently occurred during the operation, again made its appearance. The patient made a low crowing sound as though about to come out. This was followed by slow, deep respirations. The respirations ceased. As this had occurred several times before, it was not in itself particularly disturbing. The pulse could no longer be felt, however, the pupils dilated suddenly and the corneal reflex completely disappeared. In the presence of these signs artificial respiration was immediately begun, accompanied

by every possible form of stimulation. The attempted resuscitation was entirely unsuccessful. The following facts were noted:

The slow pulse of asphyxial rebreathing did not occur.

Patient was in a light anæsthetic state when she died.

She showed evidence of shock some twenty minutes before.

The color was difficult to make out, but seemed satisfactory.

There was masseteric spasm with ether. This did not appear to seriously hamper the respirations, but it showed a tendency to persist even when air and oxygen was given in abundance.

The rigidity appeared to be due to shallow anæsthesia, not to asphyxia.

Death is thought to have been due to cardiac failure, the remote cause being previous protracted hemorrhages, the immediate cause being the strain thrown upon the vasomotor system by respiratory obstruction incident to a badly accepted anæsthetic.

EXPERIENCES WITH HORMONAL IN THE TREATMENT OF ACUTE AND CHRONIC INTESTINAL PARESIS.

By JAMES TAFT PILCHER, M.D.,
BROOKLYN.

IN the development of the recently conceived ideas of therapeutics of the abdominal viscera based upon their normal physiologic stimuli, as elaborated by the tissues *per se*, Zuelzer in 1910 (Med. Klin. No. II.) recovered from various intra-abdominal organs an extract which, when injected, caused an increase in the peristalsis of the bowel. This substance, to which he gave the trade name of "Hormonal," was found to be present in the spleen in greatest quantity, from which organ it has been extracted both by physiologic salt solution and by a dilute hydrochloric acid solution in an animal killed at the height of digestion. The extract thus prepared is an amber, frequently slightly turbid solution, which, when kept under proper conditions, appears to retain its stability for at least one year.

The writer's determination to employ it was stimulated by the many instances which have come under his observation in which the exhibition of eserine salicylate had proven inefficacious—in those cases developing a parietic condition of the intestines after operation, with or without a concomitant dilatation of the stomach.

Five illustrative cases are herewith recorded in which the course of convalescence was so obviously and certainly influenced as to leave but little room for doubting that the administration of this substance, hormonal, was responsible for the favorable outcome in some of the cases which would otherwise very probably have terminated fatally.

The preparation was administered intravenously, in doses varying from 10 c.c. to 40 c.c., according to the age of the patient, and the severity of the paralytic phenomena, the basilic vein of the arm having been found to be most convenient for use. Soap, water and alcohol or iodine alone were used for cleansing the skin. The hormonal should be warmed to 100 degrees F. and be allowed to enter the vein at body temperature, the injection being made very slowly. Simple compression by a gauze compress in the cubital fossa is all the subsequent dressing necessary.

There was noted in several of the cases an immediate flushing of the face, and pounding in the head was complained of. The temperature and pulse are frequently raised, the former as much as to 103 degrees, as will be noted in one case. These phenomena are, however, quite evanescent. The unpleasant sensations are much more likely to occur in post-operative cases, who are at the time of administration in a very critical condition, than they are in patients who apply merely for the relief of atonic or habitual constipation, in which class there are, as a rule, no untoward after effects. Any symptoms of collapse or cyanosis which may supervene may best be met by camphor injected subcutaneously.

In the cases of chronic constipation, comprising knowledge of a series of some thirty-odd patients, the results have been in the majority satisfactory. This is especially so since it has been observed that the intravenous method of administration is much more certain of giving results than that by intramuscular injection, and also since larger amounts (up to 40 c.c.) are being given. The effectiveness of this preparation is greatly synergised by giving a half-ounce of castor oil at the time of injection, which observations coincide fairly well with those made by Lincoln (*N. Y. State Journal of Medicine*, Vol. XII., No. 3, p. 119).

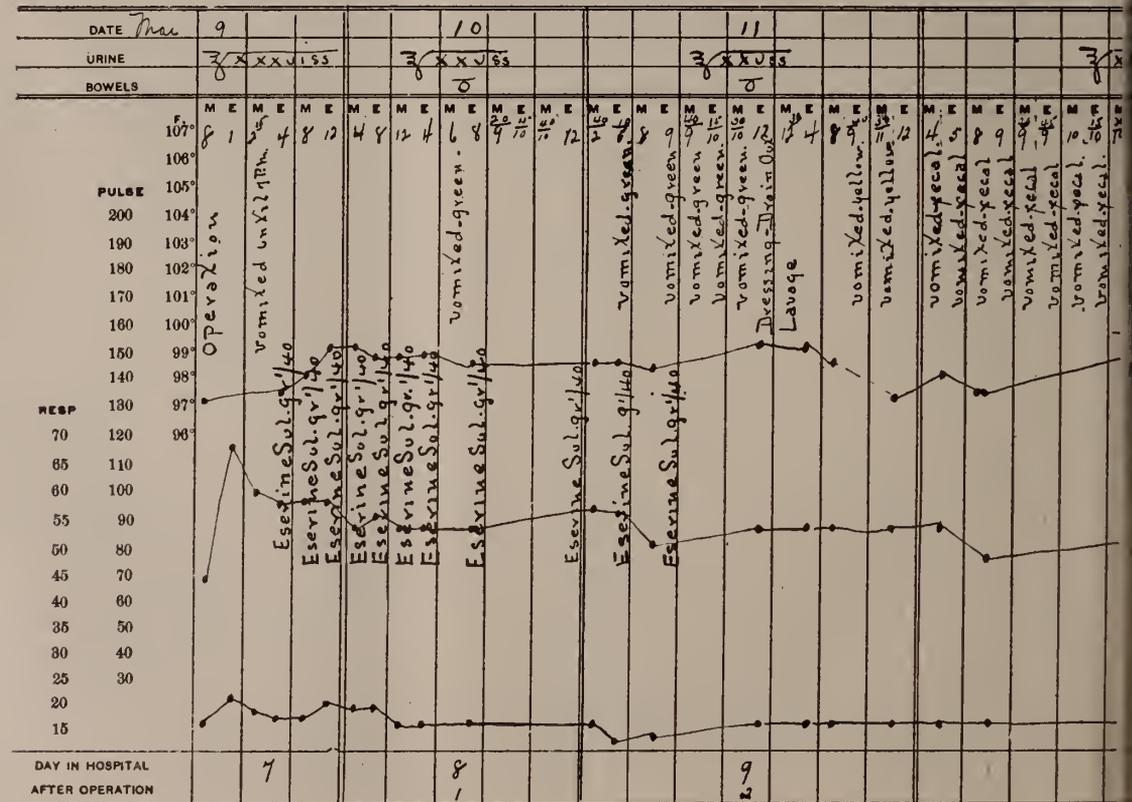
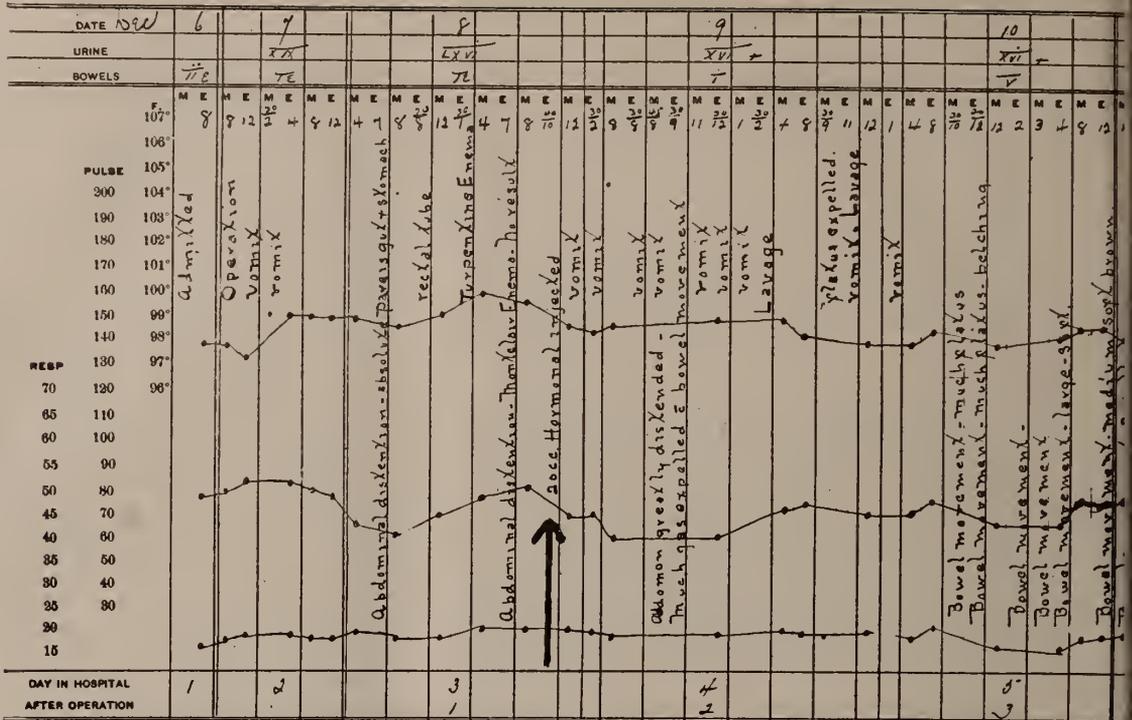
Before employing this agent in those cases of post-operative gastro-enteric paresis, occasion was taken to verify by animal experimentation the efficacy of this peristaltic hormone, for which purpose rabbits were used. By injecting intravenously amounts varying from 3 c.c. to 7 c.c. we were able to conclusively demonstrate that a physiologic peristalsis was evoked, varying in degree, however, in different animals. In control of these observations eserine salicylate grains 1-130 was similarly injected intravenously, from which administration spastic contractions of the intestine were noted to occur, which incisures remained for some time with but little propulsion of the bowel contents in some instances. Certainly its action was in no way a reproduction of physiologic peristalsis, but seemed to act more on the circular musculature, while that resulting from hormonal appeared to affect only the longitudinal fibers.

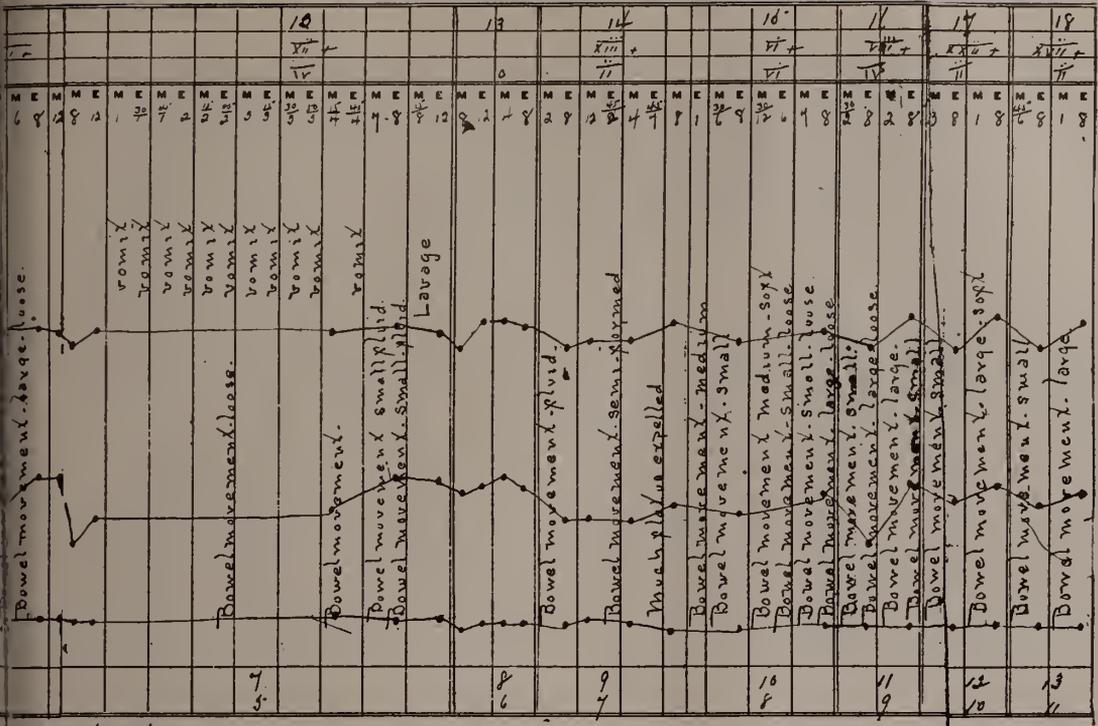
Subjective sensations in the human tend to confirm these observations, as several patients have remarked a more or less continuous peristaltic unrest for as long as five days after the injection of a larger amount (40 c.c.), but without any cramping sensations. After eserine administration others have complained of the gripping which, as is well known, not infrequently ensues.

Through the courtesy of Doctors L. S. Pilcher, A. T. Bristow and Lusk the writer has been permitted to observe and report the following cases in which he was consulted.

CASE I.—A young man suffering from symptoms of chronic colonic stasis and chronic inflammation of the appendix. Operation by Dr. L. S. Pilcher at the Pilcher Hospital disclosed a very extensive membranous pericolicitis and secondary chronic inflammation of the appendix. Procedure after method of Pilcher (*Annals of Surgery*, January, 1912) for division of membrane and re-establishment of continuity of gut. Study of Chart No. I is self-explanatory. To be particularly noted is the fact that effective peristalsis was re-established five hours after the injection of hormonal, previous to which various enemata had been given without result, and the auscultation of the abdomen showed no evidence of any peristaltic movements whatever, and continued without intermission, the patient having one or two daily stools to discharge. Further, that two days after the bowels had been reactivated a renewal of the gastric dilatation occurred, which had to be corrected by lavage. The patient is in perfect health today, and continues to have daily normal movements.

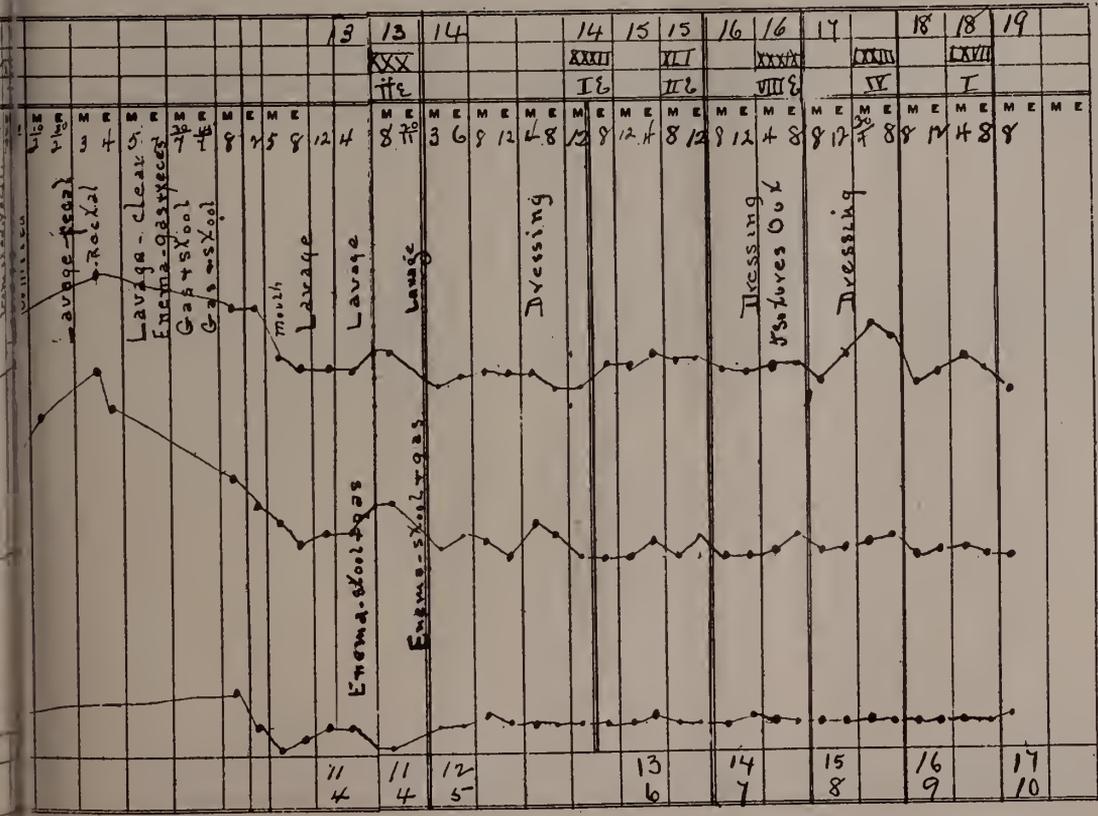
CASE II.—Young man presenting an ileo-vesical fistula, who had been previously operated on for an appendico-vesical fistula and stone in the bladder, the result of acute perforative appendicitis, from which he eventually recovered, after a very stormy convalescence, complicated chiefly by a paralytic ileus and dilation of the stomach lasting for over ten days. Because of this preceding history of post-operative ileus, measures were immediately instituted after his second operation by Doctors Bristow and Pilcher, to forestall if possible any unpleasant sequelæ. For this purpose, as indicated on Chart No. II, eserine sulphate gr. 1-40 was repeatedly administered without any result whatever. Retrograde peristalsis, the result of a paralytic ileus low in the small intestine, developed on the second day post-operative and acute dilatation of the stomach shortly evidenced itself. The vomiting quickly became fecal, indicating that there was no pressure on the duodenum by the root of the mesentery. Lavage in no way corrected the conditions, serving only to alleviate the stomach distress and distention. As indicated on Chart No. II, 40 c.c. of hormonal was introduced intravenously, which caused a temporary rise in pulse and temperature and a marked evanescent cyanosis. Within





very activated

Very crosses



five movements of the bowels occurred. Peristaltic activity continued throughout the next day, but the patient gradually sank from the uncontrollable hiccoughs, which were not the result of hormonal, as they were manifest previous to the injection, and died six days post-operative (chart No. V).

This preparation of peristaltic hormone is not entirely innocuous, although in many cases no unpleasant reaction has been noted. In others, however, there have been remarked various grades of vaso-motor disturbances which, while seemingly not dangerous, indicate that a profligate institution of its administration, by those not proficient in the technic of injecting it, and not equipped with the proper agents to combat shock, is to be counseled against. Kretschmen (*Munch. Med. Wochenscher*, Feb. 27, 1912, LIX, No. 9, pp. 457-512) reports an instance of immediate collapse following intravenous injection, from which the patient fortunately recovered after vigorous stimulation. Dittler and Mohr report a similar case which was ascribed to a lowering of the blood pressure.

Its exhibition in post-operative cases has been, in my experience thus far, most fortunate, but, as previously noted, the by-effects are much more likely to become manifest in patients who are already deeply shocked than in those to whom the injection is given who are in comparative health and strength. Certainly in the latter class of cases, comprising some of the more obstinate forms of atonic constipation, its results have been quite remarkable.

THE PATHOGENESIS, ANATOMY AND CURE OF PROLAPSE OF THE RECTUM.*

By ALEXIS V. MOSCHCOWITZ, M.D.,
NEW YORK CITY.

INTRODUCTION.

THE malady conventionally known as "Prolapse of the Rectum" has always occupied a prominent place in medical literature. The reason for this prominence is obvious; both our understanding of the disease and the methods thus far advocated for its relief are unsatisfactory. This dissatisfaction has stimulated me, as it has so many others, to study this disease more closely. A fairly extensive hospital service, augmented by the courtesy of many colleagues, has given me the abundant opportunity which I desired. As a result of these observations, I believe, I am now able to formulate a satisfactory and perfectly demonstrable pathological anatomy of prolapse of the rectum, and based on this anatomy I am also enabled to suggest an operation, which has raised, in my hands, the percentage of cures from practically nil to one hundred.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

My theory and operation is based upon the demonstrable fact that prolapse of the rectum is a hernia; and that in all its features, etiological, pathological, clinical, and therapeutic, it conforms to the well recognized principles of hernia in other parts of the body. Inasmuch as my ideas on this subject may therefore appear somewhat unorthodox, I shall elucidate my subject in greater detail than usual. It is for this reason I plead tolerance for any apparent prolixity of this paper.

Nomenclature.—The term "Prolapse of the Rectum" is to my mind a misnomer, because the anatomical rectum is not prolapsed, except in the very last stage of the disease. Nor should those maladies grouped under the generic name of "intussusception" be included under the heading of this disease. Intussusception, as is well known, is due to a prolapse of a superior portion of the bowel, frequently of the ileocecal portion, sometimes even of the small intestine. On superficial examination, such an intussusception simulates a so-called prolapse of the rectum; but neither in symptomatology nor in pathology nor in therapy have they anything in common. At best they may be termed prolapses *out of* the rectum, but *not of* the rectum. This distinction may appear obvious, but it is surprising that most American textbooks on rectal diseases, and many special papers on the subject, still maintain this identity.

Broadly speaking, the disease we are considering is characterized primarily by a protrusion of the mucous membrane of the rectum outside of the anus. Experience has taught us, however, that granting even the existence of this essential characteristic, there may be present two entirely different maladies.

In the first, there is a protrusion of the mucous coat only; while the remaining coats of the rectum are in normal relationship with the surrounding structures. This should be termed a "prolapse of the mucous membrane of the rectum." Incorrectly it has received the name "Prolapse of the anus." It is manifest that the anus, being merely a hole, cannot prolapse.

In the second, the mucous membrane is in normal relationship with the other coats, but the entire rectum (with certain restrictions in phraseology) has been protruded out of the anus, and has lost its normal relationship to the surrounding structures. This is the form which has, by the way, also incorrectly, been termed "Prolapse of the rectum," and is the one which forms the principal theme of this paper. In view of the fact that the term "Prolapse of the rectum" has become a convention, we will continue to use it, under protest, in want of a better.

True prolapse of the rectum in turn has numerous subdivisions which, however, will be discussed under the heading of Pathological Anatomy.

Pathogenesis and Pathological Anatomy.—(1). The oldest, and, I might add, least probable the-

ory as to the pathogenesis of a true prolapse of the rectum is that of Esmarch.¹ According to this author the primary cause is an inflammation of the mucous membrane of the rectum, a sort of a catarrh. The inflammation is then presumed to spread to the other coats, and ultimately involves even the supporting structures of the rectum. This theory is not tenable for several reasons; but principally, because to our knowledge, inflammatory conditions of the mucous membrane of the rectum, no matter how intense, are not followed by prolapses of the rectum. When we do have an inflammation of the mucous membrane, as is so frequently seen in infants and young children, there follows at best a prolapse of the mucous membrane; but this in turn, is not followed by a true prolapse of the rectum. It appears to me very probable that Esmarch has taken effect for cause, since we know that a catarrhal inflammation is only a late manifestation of prolapse of the rectum.

(2). Jeannel,² as near as I could understand it, explains rectal prolapses as occurring in consequence of a ptosis of the small intestine, which allows them to sink into the cul de sac of Douglas; by their weight, the intestines cause a pressure atrophy of the levator ani, which ultimately gives way, and allows the occurrence of a prolapse. This theory, while it goes somewhat nearer to the root of the trouble, is also untenable, because, as a rule, we do not find this pressure atrophy. The animal experiments which were carried out in order to prove this theory, were so mutilating as to invalidate them.

(3). The prevailing theory at present, and the one that I believe to be correct, is, that prolapse of the rectum is a hernia, in the true sense of the word. This theory has arisen largely as a result of the anatomical studies of Waldeyer,³ and has been confirmed by the clinical researches of Ludloff,⁴ Zuckerkandl,⁵ Napalkow,⁷ Dix,⁸ and others.

In order to fully appreciate this theory, a substantial knowledge of the anatomy of the pelvis and its contents is essential. In addition there are, however, certain simple, fundamental principles, to which attention should be called.

In a paper⁹ read before the Surgical Section of the New York Academy of Medicine, December 1, 1911, I explained in detail my conception of a hernia, and pointed out the paramount importance of the transversalis fascia in relation to hernia. As a knowledge of this fascia is also essential to the proper understanding of prolapse of the rectum, I shall recapitulate briefly the anatomy of this structure, particularly its relationship to the various structures which pass through it.

(1). The entire abdominal parietes, front, sides, top and bottom, are lined by peritoneum.

(2). Externally to the peritoneum there is everywhere a layer of fascia. This fascia has received different names in different parts of the

abdomen, *e. g.*, transversalis, pelvic, iliac, diaphragmatic, etc. If traced, however, it will be found that these are merely parts of one continuous layer.

(3). All the large vessels in the abdomen, and all the viscera of the abdomen *lie upon* the transversalis fascia, and are *covered by* the peritoneum. I regard this fact of the greatest importance in the proper understanding of the anatomy of hernia in general, and of prolapse of the rectum in particular. For this reason I shall discuss this subject in detail. In order to elucidate my subject I will explain first the pathogenesis of an ordinary hernia; and for the sake of simplicity, I have selected the femoral variety.

Figure 1 represents schematically a cross-section of the abdomen at any point above the bifurcation of the aorta.

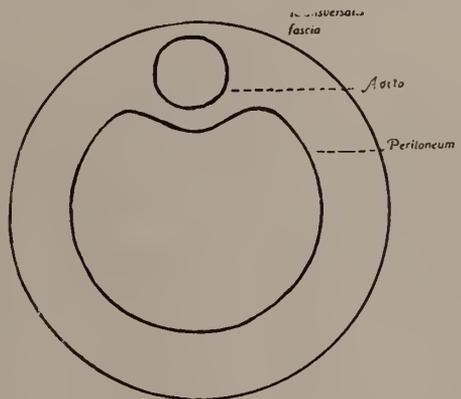


Fig 1

tion of the abdomen at any point above the bifurcation of the aorta.

At the point of exit of the femoral vessels into the thigh, the diagram is modified as in Figure 2.

If Figure 2 is closely examined it will be seen that at the point where the external iliac vessels lose their relationship to the peritoneum, there is an opening in the transversalis fascia, in order to permit the escape of these vessels from the abdomen.

As a matter of fact, however, careful dissec-

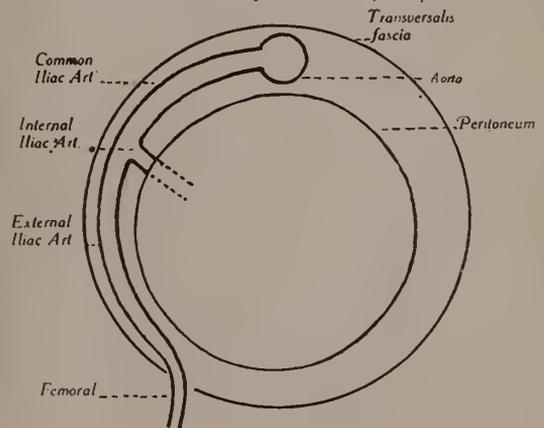


Fig. 2

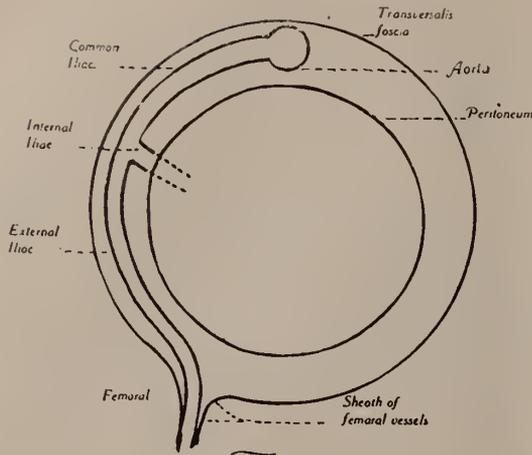


Fig. 3

tion will show that the transversalis fascia is continued downward for a certain distance upon the vessels, gradually becoming thinner and thinner, blending finally with the vessel wall itself. To be exact, therefore, Figure 2 should be modified as in Figure 3.

In certain parts these perivascular prolongations of the transversalis fascia have been carefully studied, are well marked, and indeed, have received special names. I mention as such the prolongation upon the spermatic vessels, which is called the "infundibuliform fascia," and the prolongation upon the femoral vessels, which has received the name of "sheath of the femoral vessels."

Although the importance of the transversalis fascia has not, I believe, been estimated at its true worth, it is an established fact that this fascia is, as a rule, strong enough to retain the viscera within the abdomen. It is, however, not strong enough to do so, at certain definite anatomical points, and it is at these points, and at these points only, that we find hernia. A little reflection will show that hernia occur only where blood vessels or viscera make their exit normally.

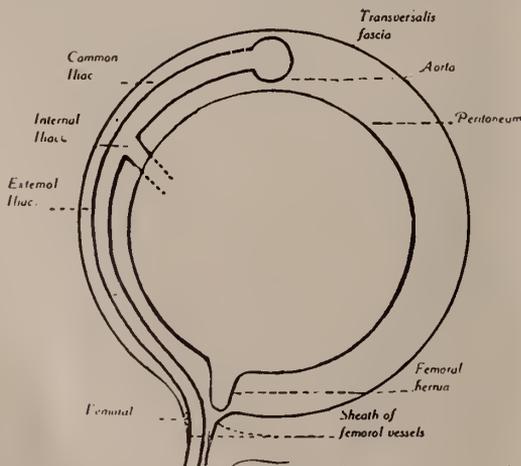


Fig. 4

In other words, it is very apparent that these weak anatomical points must be the attenuated perivascular or perivisceral projections of the transversalis fascia. Every hernia, *e. g.*, femoral hernia, can therefore be diagrammatically presented as in Figure 4.

There is no doubt, though it never was stated before, that a similar arrangement holds true for every blood vessel that escapes from the abdomen to the periphery, as for instance, the obturator or sciatic arteries. Likewise there exists a similar hiatus in the transversalis fascia whenever a viscus, *e. g.*, the rectum or the vagina, escapes from the abdomen to the periphery, and is accompanied by a similar prolongation of the transversalis fascia.

Let us now note how a knowledge of these facts assists us in explaining the pathogenesis of prolapse of the rectum.

Figure 5 represents diagrammatically a latero-vertical section of the abdomen, at the point

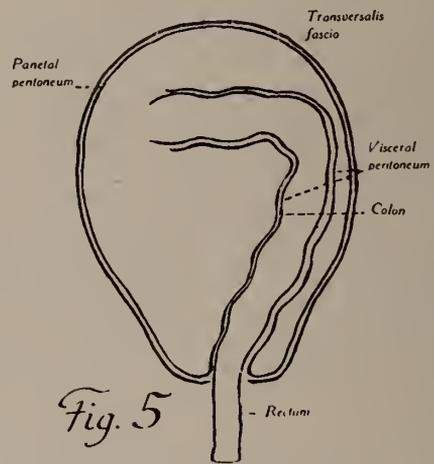


Fig. 5

where the large intestine escapes from the abdomen and becomes rectum.

Figure 6 represents the same condition in an antero-posterior section of the pelvis.

Both of these sections are intended to present the hole in the transversalis fascia, through which the rectum escapes from the abdomen.

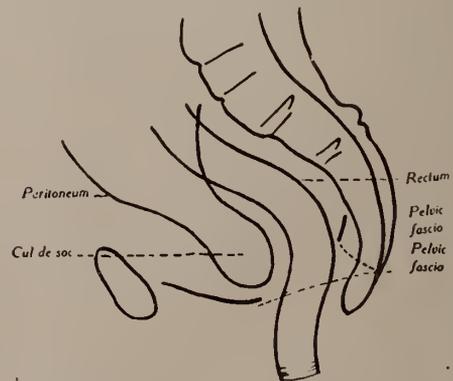


Fig. 6

Nature, however, adds a nicer finish to this hole; and just as it has been found, that the transversalis fascia sends a downward prolongation upon the spermatic, femoral and other vessels, we also find that the pelvic part of the transversalis fascia sends a similar outward prolongation

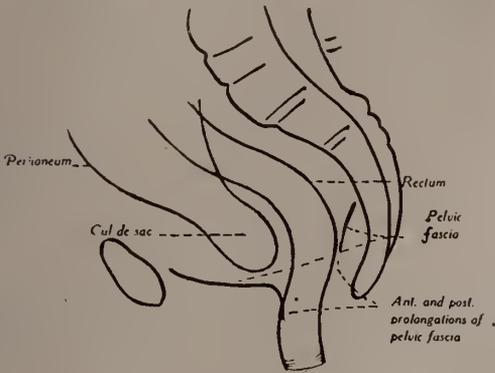


Fig. 7

upon the rectum, upon which it gradually becomes lost. To be exact, therefore, Figure 6 should be modified so as to appear as in Figure 7.

If we now compare Figure 7 with Figure 3, we will note the close similarity between the two.

As in other herniæ, the subsequent development of a prolapse of the rectum is not easy of explanation. It is well known that there exist two theories for the origin of hernia. First, that which regards the sac as a congenital malformation, and second, that which regards the defect in the transversalis fascia as the *causa peccans*. We find, in truth, that both these theories are also applicable to prolapse of the rectum.

In early embryological life the peritoneum reaches downward almost to the perineum. Later it becomes shut off and recedes higher and higher. It is well conceivable that if this shutting off process stops early, the cul de sac of Douglas will be deeper than is normal. This affords a substantial basis to the congenital or saccular theory of rectal prolapse.

The congenital or saccular theory of hernia has never appealed to me strongly, except for those cases of which we know, that there is no doubt of the congenital nature of the sac; and I am more inclined to the second theory. In the paper already referred to (*Medical Record*, December 30, 1911), I have pointed out my conception of a hernia. In this I stated, first, that there must be a defect in the transversalis fascia, whenever a vessel or viscus escapes from the abdomen to the periphery; and second, that at the location of this defect, there must be an eversion of the transversalis fascia, which is continued downward and outward, for some distance upon the vessel or viscus, gradually becoming thinner and thinner, and is finally lost upon it. The conditions being thus favorable, it requires only some added factor for the production of a hernia,

namely, some increase in the intraabdominal pressure, such as straining (secondary to heavy work, parturition, habitual constipation, coughing, phimosis, vesical calculi, stricture of the urethra, etc.), which will drive the peritoneum into the sheath formed by the outward prolongation of the transversalis or pelvic fascia.

When we consider all the points that I have just stated I believe Figure 8 would be a diagrammatic, but nevertheless true, representation of a prolapse of the rectum, in its very incipiency.

I need hardly say that I have no proof of this state, and that I argue merely from analogy with other herniæ, and from the anatomy of the parts in question.

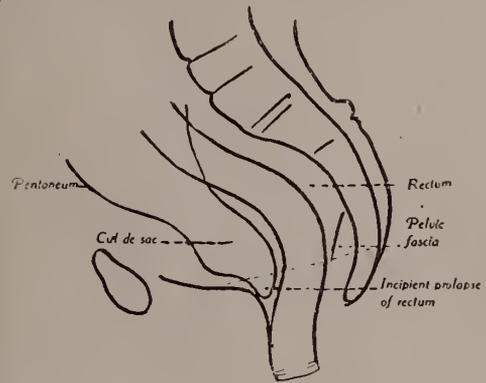


Fig. 8

The subsequent development of the prolapse is most interesting, and depends upon definite anatomical facts, which must be known in order that the pathological anatomy of prolapse of the rectum be intelligible. It is important for us to know:

1. That the peritoneum covering the anterior surface of the rectum is intimately adherent to it. This is important, because it explains why, in spite of the fact that prolapse of the rectum is a hernia, we do not have a distinct and separable peritoneal sac. In other words, this hernia is exactly analogous to the so-called "hernie par glissement."

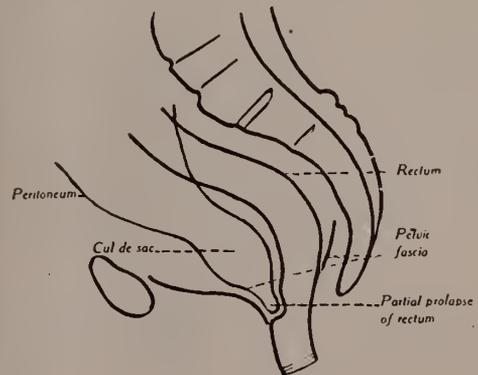


Fig. 9

2. That the under surface of the levator ani is also covered by a very dense fascia; this, together with the other component parts of the perineal body, prevents the progress of the hernia in a downward direction.

For a short while the muscular wall of the rectum itself prevents the further growth of the hernia, but this is comparatively weak, its resistance is limited, and it readily gives way to the persistent intraabdominal pressure, so that the next step in the formation of the prolapse must be as is diagrammatically illustrated in Figure 9.

When this stage has been reached, there is for a while nothing to prevent the subsequent growth of the prolapse. The prolapse increases mainly

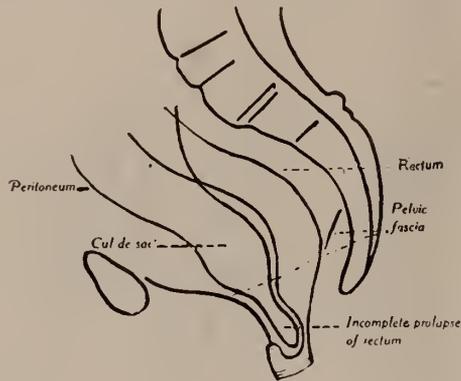


Fig. 10

in a posterior direction, until it is arrested, first by the posterior wall of the rectum, and when this ceases to give support, by the underlying sacrum and coccyx. So that at this stage Figure 10 would be a true presentation of the prolapse.

But the intraabdominal pressure still continues. The prolapse, as was shown in the last diagram (Figure 10), can not extend backward, being prevented by the sacrum and coccyx; it must, therefore, change its course, and sliding along the posterior wall of the rectum, it extends at first in a downward and forward direction, and finally

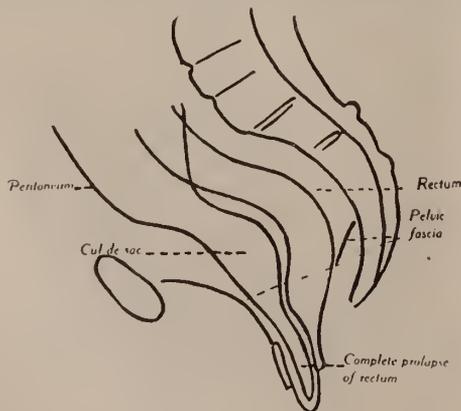


Fig. 11

again backwards, towards the anus. Ultimately this is also forced, and the prolapse appears externally. This stage is represented in Figure 11.

I am in the fortunate position to have come across, by a peculiar circumstance, two cases of prolapse of the rectum, at what may be considered the stage represented in Figure 10.

During my internship at the New York German Hospital in 1893, by the courtesy of Dr. Willy Meyer, I removed the coccyx in a case of supposed coccygodynia. The wound healed by primary union. Promptly upon his discharge from the hospital, the patient noticed a bulging in the scar. The bulging increased, and when I next saw him, he had in the coccygeal region a perfect hernia, with all its characteristics. He never consented to its radical cure. The more I think of this case the more I conclude that the symptoms complained of by this patient were due, not to coccygodynia, but to a beginning prolapse of the rectum.

For my second case I am greatly indebted to Dr. Chas. H. Peck, who successfully operated upon it, by the method to be later described.

Mrs. M. W., 44 years of age, was admitted to Roosevelt Hospital on November 7, 1911, suffering from a hernia in the median line posteriorly, just below the sacrum, in the cicatrix of an operation performed fourteen months previously at another hospital, for excision of the coccyx.

The protrusion was marked on standing or sitting upright, and examination indicated that the small intestine, pushing the rectum before it, formed the contents of the hernia. The hernial aperture easily admitted three fingers. The sac was evidently continuous with the cul de sac of Douglas, and the procedure of obliteration of the cul de sac, recommended by Dr. Moschcowitz, was decided upon as the first step in the attempt to cure the hernia.

The operation was performed on November 8, 1911. Through a median laparotomy wound the cul de sac, which was unusually deep, and the bottom of which formed the hernial sac, was obliterated by successive tiers of catgut sutures, as high as the middle of the body of the uterus.

No attempt was made to close the hernial ring at this time. On November 21st, the hernial ring was closed by a second operation. Before this was done the patient was allowed to stand up, and it was found that the protrusion of the hernia had entirely disappeared, though the aperture was still open, *i.e.*, the small intestines no longer descended low in the pelvis and forced the rectum through the aperture. Closure of the aperture was effected with difficulty, and not very satisfactorily, but on discharge from the hospital on December 16th the hernia seemed completely cured.

The obliteration of the cul de sac, and thus of the hernial sac, seemed to me the keynote of the success of the operation.

I look upon both of these cases as prolapses of the rectum, but the coccyx, having been extirpated, was not present to withstand the progressive growth of the prolapse, as shown in Figure 10. In the absence of the coccyx, the posterior wall of the rectum also gave way, and appeared as a bulging in the scar. According to my interpretation, Figure 12 presents the disease at this very peculiar stage.

Thus far, as shown in the diagrams, only the

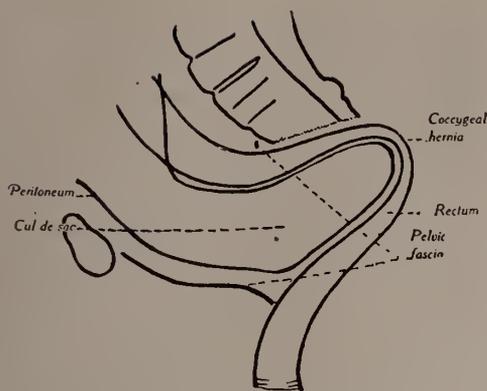


Fig. 12

anterior wall of the rectum is involved. The lowermost part of the rectum being firmly fixed, the prolapse can not increase at its expense; therefore, in the subsequent growth, it can enlarge only by drawing in first the two lateral, and finally also the posterior walls, until the further drawing in of the bowel is prevented by the firm fixation of the organ.

This has a very important bearing upon the physical signs of complete prolapse, and explains why even the largest prolapses never exceed five to six inches in length.

With these data we are now in a position to explain why the term "prolapse of the rectum" is a misnomer. All the walls of the rectum prolapse only in the very last stage, and even then are only drawn down by the anterior wall.

In order to complete the nomenclature, according to my interpretation, I suggest the following subdivisions:

1. *Incipient prolapse of the rectum*, illustrated in Figure 8.
2. *Partial prolapse of the rectum*, illustrated in Figure 9.
3. *Incomplete prolapse of the rectum*, illustrated in Figure 10.
4. *Complete prolapse of the rectum*, illustrated in Figure 11.

This corresponds to the classification of inguinal hernia, in which we are also wont to distinguish between a bubonocoele and scrotal hernia.

There is not the slightest doubt in my mind that all of these actually exist, although as a rule, the earliest stages can not be demonstrated. Unlike inguinal hernia, the rectal protrusion in its early stages is invisible, and the patient ascribes his symptoms as due to hæmorrhoids, habitual constipation, etc. If a physician is consulted the true nature of the malady is overlooked. I believe that in the course of time these conditions will be recognized; when this occurs the prognosis and treatment of these cases will be affected materially.

Symptoms and Physical Signs.—Primarily I wish to mention that I intend to describe only

the symptoms appertaining to true prolapse of the rectum; other conditions will be discussed only when a question of differential diagnosis arises.

The presence of a mass protruding from the rectum is manifestly the cardinal symptom. This is frequently accompanied by a discharge of pus and blood. The patient avers that the protrusion is of long standing, and that it had ceased growing after it had attained its present dimensions. At first the patient is able to reduce the protrusion voluntarily (action of the levator ani), but in the course of time, reduction became possible manually only.

In neglected cases, and those of very long duration, the sphincters are so stretched that the prolapse does not stay up, even when reduced, and patients suffer without ever attempting to reduce it. (In rare instances the prolapse becomes incarcerated, with all the symptoms of incarceration; of these, however, I will not speak at the present time.)

On inspection there is found a mass protruding from the anus, usually of an inverted cone-shape, and hardly ever exceeding a length of five to six inches. (In reality, the mass is twice that length, for the protrusion is made up of two cylinders.) Its surface is covered by mucous membrane, which varies in appearance; it may be normal, or greatly inflamed and thickened, or covered by ulcerations, which bleed very readily, or covered by a diphtheritic membrane. The mucous membrane of the inner cylinder is normal, or at most slightly hyperæmic.

Upon the apex of this protrusion there is an opening, which is directed backward. If one would make two lateral incisions, exactly from the center of this opening, the anterior part would exceed the posterior by at least three to one. This must necessarily be so, if the explanation of the pathological anatomy I have given is true.

The anterior half gives very frequently a tympanic note on percussion, because it is usually filled by small intestines; the posterior half is dull on percussion. These symptoms are not present in so-called prolapse of the anus, nor in invaginations.

If the case has not been operated upon before, or otherwise neglected, invagination of the finger between the sphincter and the anterior surface of the prolapse will be presented by a sulcus of the depth of about an inch. (See Figure 11.) In prolapse of the anus there is no such sulcus, because the prolapse begins at the muco-cutaneous junction, while in intussusceptions the sulcus is so deep that it can never be reached by the examining finger.

Unless incarcerated (very rare) the entire prolapse can be reduced, either by the patient contracting the levator ani, or it can be replaced manually. Sometimes gurgling is noted when the prolapse is being reduced, on account of the small intestines contained in the anterior half.

When the prolapse is reduced, the following physical signs are present: The rectum usually imparts a sensation of fullness to the examining finger, because the normal outlines are obliterated, and because of the laxity of the tissues. The anterior surface gives as distinct an impulse on coughing as any hernia. To prove that rectal prolapse is a hernia I have demonstrated a very interesting phenomenon. I have found, namely, that after the prolapse is reduced, if the finger is introduced along the anterior wall it requires but the slightest pressure of the fingers to keep it reduced, no matter how much the patient strains. If the finger is now held against the posterior surface, no amount of pressure exerted will prevent the prolapse from coming down.

The tone of the sphincter varies; in some cases its tone is very good, and its voluntary contractions are very readily elicited. In some cases again, the tone is entirely lost, its fibres are stretched to a maximum, easily permitting the introduction of the entire fist.

Treatment.—It is a well known axiom in medicine that the more remedies there are suggested for the cure of a malady the less the likelihood of the efficacy of any particular one. This is eminently true in regard to the immense number of measures that have been recommended for rectal prolapse. The following are the more important procedures employed or suggested:

A. NON-OPERATIVE METHODS.

I. Medication and topical applications in order to cure the catarrh. This is doubtlessly of value in cases of so-called prolapse of the anus, but certainly cannot be of permanent benefit in cases of true prolapse of the rectum.

II. Electricity.

III. Submucous injections of astringents, or of carbolic acid, strychnine, ergot, tannic acid, etc.

IV. Mechanical supports.

V. Massage after the method of Thure Brand. Good results have been reported from this measure. The use of massage is founded on the theory that it strengthens the muscular wall of the rectum, and the levator ani. It is based on the misconception that the primary cause of prolapse of the rectum is a weakness of these structures. Furthermore, the favorable results reported are mostly in children, in whom true rectal prolapses are rare.

B. OPERATIVE METHODS.

I. Methods the aim of which is to cause a narrowing of the anal aperture, and more or less of the adjoining rectum.

1. Cauterization of the rectal mucosa with the actual cautery, nitric or sulphuric acid, or chloride of zinc.

2. Elliptical resections of the mucous membrane of the rectum, with subsequent suture. Delorme.¹⁰

3. Wedge-shaped resection of the posterior wall of the rectum, including more or less of the

sphincter, with subsequent suture, has been practiced by Dieffenbach¹¹ and was subsequently revived by Roberts.¹²

4. Thiersch¹³ introduces subcutaneously a ring of silver wire in the region of the sphincter, which is supposed to heal in, and acts as a support.

5. Gersuny's¹⁴ method of twisting the rectum is too well known to require lengthy description.

6. Paraffin injections in the regions of the sphincter have been proposed also by Gersuny.

7. Bier¹⁵ removes the entire mucosa from the outer cylinder of the rectal prolapse. The submucous structures are then reefed together into a welt, thereby strengthening the external sphincter; finally, the mucosa is sutured to the integument.

It does not require lengthy argument to show the fallacy of these methods. At best, they merely act as a sort of a natural pessary, and a very poor one at that. Sooner or later the prolapse must recur. The good results that have been reported from the application of any of these methods can be accounted for by too short a period of observation.

II. Methods devised to strengthen the natural supports of the rectum. These methods are closely related to the preceding group, the difference being that the procedures are performed upon the bowel, at a somewhat higher level.

1. The method of Ott,¹⁶ who performs what is practically an inverted perineal plastic.

2. Hoffmann's¹⁷ method, also recommended by Poppert.¹⁸ An "H"-shaped incision is made behind the anus; the resulting side to side denudation is then stretched so as to form an antero-posterior denudation, which is then closed by deep and superficial sutures. In view of the fact that Hoffmann, in his article, shows an excellent conception of the pathology and pathogenesis of prolapse of the rectum, it is somewhat surprising that he nevertheless devises and recommends an obviously inefficient method for its cure.

3. Beresnegowsky¹⁹ attempts to build up a new support for the rectum by a muscle plastic from the two glutæi.

4. Napalkow⁶ was the first to recognize the importance of the deep structures. He makes a transverse incision in front of the anus, and works his way upwards to the peritoneum; this he closes off, and finally sutures the two levators together. If the latter are too lax, they are shortened by reefing sutures.

None of the methods of this group can be looked upon as curative, because they do not take into consideration the pathology of prolapse of the rectum. I except from this criticism the method of Napalkow. The objections to Napalkow's method, however, are that he overlooks the important fact that prolapse of the rectum is a sliding hernia, and that therefore there is no hernial sac which can be resected and ex-

tirpated; furthermore, it is exceedingly difficult, if not impossible, to suture together, at such great depth, the two levators and the upper layer of the pelvic fascia, with the requisite care and exactness.

III. Methods which pay particular attention to the fixation apparatus of the rectum.

1. Methods which attack the problem below the level of the levator ani.

a. Verneuil²⁰ resects the coccyx and sutures the rectum to the integument.

b. Gerard Marchant²¹ also resects the coccyx; he then infolds the rectum by longitudinal sutures, and finally fastens it to the lower end of the sacrum. This operation was modified by Koenig, who passes the sutures through holes drilled through the sacrum.

c. Ekehorn²² reduces the prolapsed rectum and passes, under the guidance of the finger, a silk suture, on one side of the sacrum, into the rectum, and out on the other side of the sacrum; the suture is then tied behind the sacrum. He reports three cases as cured, but it is questionable whether any of his cases were true prolapses of the rectum. From their description one is more inclined to the opinion that they were merely prolapses of the mucous membrane. Furthermore, while no ill luck followed any of his cases, surgeons at the present time rather fear the occurrence of infection after such an operation.

d. Sick²³ argues against Ekehorn's operation, and in its stead recommends merely tamponade of the retrorectal space.

In fact, all of these operations are badly conceived: they all operate upon the posterior wall of the rectum, which, as we have shown, plays no role in the production of a prolapse.

2. Methods in which the fixation apparatus of the rectum is strengthened through a laparotomy incision. They are based upon the notion that the fixation apparatus of the rectum, through its connection with the sigmoid flexure, is too lax. In consequence, most of them are practically only sigmoidopexies, variously modified in their execution.

a. Jeannel² sutures the sigmoid to the anterior abdominal wall. For the purpose of firmer fixation, and also for the sake of being able to treat the colo-proctitis by means of irrigations, he also opens the gut and establishes an artificial anus, which is to be closed at a subsequent operation.

In order to obviate this opening of the gut, and yet to attain its permanent fixation, the operation passed through a number of modifications, but all are based on Jeannel's theory of fixation of the sigmoid flexure. Thus,

b. Weber²⁴ attaches the sigmoid to the fascia and muscles of the anterior abdominal wall.

c. Herzen²⁵ fixes the sigmoid to the anterior abdominal wall and, in addition, makes an anastomosis between its two limbs.

d. Rotter²⁶ makes a retroperitoneal pocket in the left iliac fossa for the sigmoid flexure.

e. Caddy²⁷ performs what may be termed a proctopexy to the anterior abdominal wall.

f. Ludloff⁴ recommends division of the sigmoid and fixation of the distal limb to anterior abdominal wall, after closure of its divided end; the proximal end is then implanted laterally into the distal.

g. von Eiselsberg²⁸ has advised resection of the sigmoid flexure, prior to its fixation to the anterior abdominal wall.

These are the operations which have gained the greatest favor among surgeons at the present time. This is due to the ease of performance and minimum of risk. It appears to me, however, that they are all badly conceived, because the distal end of the sigmoid is fixed to the sacrum and pulling upon it, and can have but very little, if any, effect upon the prolapse of the rectum. Nor do I wish to speak at length, at this time, of the risk of unnecessarily fixing the intestine to the anterior abdominal wall, a danger which I have pointed out in a previous communication.²⁹ Theory aside, the futility of these operations is shown in the almost invariable recurrence of the prolapse after a sufficient period of observation.

IV. Methods which attempt to get rid of the prolapse by resecting it.

1. Gerhardt removed the prolapsed rectum by means of an eccraseur.

2. Weinlechner³⁰ removed the prolapsed rectum with a ligature.

3. Esmarch¹ used for this purpose, an elastic ligature, and finally,

4. Mikulicz³¹ (in reality, done the first time by Aufert) removes the prolapse with knife or scissors, closes off the anterior cul de sac, and then sutures the outer and inner cylinders together at the line of section. This operation has undergone numerous modifications, mostly as to the technique, *e.g.*, Sheldon,³² Cunningham,³³ etc., but the underlying principle remains the same. It has, however, numerous objections. Among these I would mention hemorrhage; the difficulty to suture together two sections of gut of such unequal calibers as the inner and outer tubes are; the danger of sepsis and peritonitis; in fact, this is the only operation which has an appreciable mortality; and last, but not least, the number of recurrences, in spite of the great authority of its sponsor, is very high. This is readily accounted for according to the pathology I have offered. In fact, the operation may be said to even invite a recurrence, because the hernial sac still remains, and, if anything, has been brought down to a lower level.

The Author's Operation for Prolapse of the Rectum.—My experience with the operations just enumerated does not extend to all. I have tried several (cauterization with the actual cautery, Delorme, Roberts, Thiersch, Bier, Marchant, sigmoidopexies of various kind, and Mikulicz's

method) that at the time have appeared to me to be rational, and have witnessed the results of a considerable number of various operations in the practice of my colleagues. In all, recurrence was almost the universal rule.

When my studies led me to the conclusion that prolapse of the rectum was in every essential a hernia, I set out to devise an operation in which the principles of an operation for the cure of a hernia could be carried out.

In my earlier studies, with this end in view, I conceived an operation which could be performed from below. I therefore performed the following operation in one case:

Abraham R., 50 years of age, was admitted upon the First Surgical Division of Mount Sinai Hospital, in the service of Dr. A. G. Gerster (and I take great pleasure in acknowledging my gratitude for his co-operation and permission to operate these cases), April 17, 1908, with a prolapse of the rectum, four inches in length, and of twelve years' duration. He was operated upon April 21st by the following method:

An incision was made from about the middle of the sacrum to the posterior margin of the anal sphincter. The sacrum was now divided transversely, and the entire bone flap, including the coccyx and attached muscles, was reflected downwards. My idea was to now loosen up the rectum and retract it to one side, in order to reach the peritoneal sac. I was chagrined to find, however, that the ampulla of the rectum was so large as to completely block the anterior structures; furthermore, the resulting hole was so deep that sutures could be passed with the greatest difficulty only. To add to the embarrassment, I had overlooked the important fact that we were dealing with a sort of a sliding hernia; in other words, there was no isolable and removable sac. However, I finished the operation by closing off by sutures that part of the cul de sac of Douglas which I had opened and then sutured the two levators together and to the rectum. The bone flap was replaced and fastened by sutures. In the subsequent course the bone flap necrosed, necessitating its removal. Patient lived a little over four weeks and died of an ascending pyelo-nephritis. It is true that during his lifetime there was no recurrence of the prolapse, but I would not be understood as reporting a cure. On the contrary, in spite of the correct anatomical principle involved, I abandoned the procedure, and returned to my original method, that of reaching the malady by the abdominal route. This is the one practised by me at present, and which I submit for your consideration.

Median abdominal incision, extending from the symphysis pubis to the umbilicus. After opening the abdomen, the patient is placed into an extreme Trendelenburg position. Every one with any experience knows the depth of the cul de sac of Douglas in a normal case, but he will be

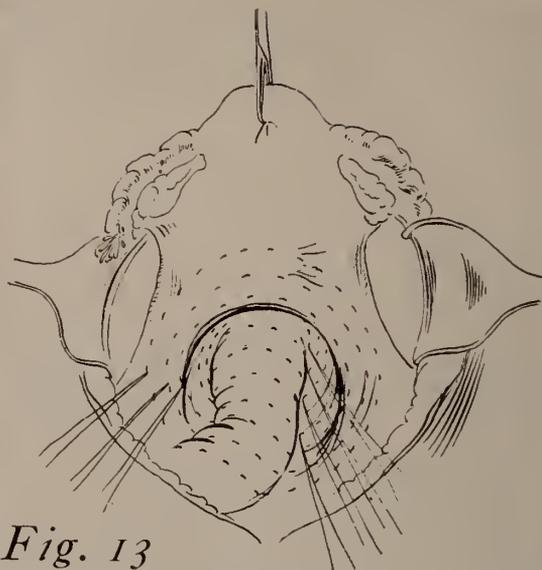


Fig. 13

intensely surprised at its depth in cases of prolapse of the rectum; in fact, it extends several inches beyond the anus, as one can readily convince himself. The rectum is now pulled up and held taut. The subsequent steps vary according to the sex of the patient. I shall describe an operation in the female sex.

Pagenstecher or silk sutures are passed circularly around the cul de sac of Douglas and tied. The lowermost suture is placed about one inch above the inferior extremity of the cul de sac; similar sutures, six to eight in number, are passed at intervals and persisted in as long as the peritoneum comes together, until practically the entire pouch of Douglas is obliterated. (Figure 13.)

It is advisable, and I always try to include into my suture the pelvic fascia, particularly that part which covers the levator ani; how often I really succeed in doing this I am not in a position to state.

(Theoretically, it would be better to split the peritoneum in the depth of the cul de sac, and to suture the fascia first. I have attempted to do so in one case, but found the procedure so difficult that I abandoned it.)

When the sutures reach the region of the supravaginal portion of the cervix and body of the uterus, the sutures are anchored to these structures.

When approaching the rectum, the sutures coming from the sides of the pelvis catch the serosa covering it in firm and close stitches. This is done in order to prevent the possible formation of a hernia; in addition, these lateral sutures also materially aid in fixing the rectum to the sacrum and coccyx.

There are two structures which should be avoided, namely, the ureters and internal iliac vessels. The former can be marked by introducing ureteral catheters; the pulsation of the

latter can be felt. Neither of these structures have thus far caused me any embarrassment.

In older women the uterus is stitched to the anterior abdominal wall.

No fixation of the intestine, viz., sigmoid flexure, as being superfluous, is undertaken.

Suture of the abdominal wall in layers.

The after treatment is simple. I neither constrict the patients, nor move their bowels, until they do so of their own accord, which usually occurs in less than a week. I have found that most of the patients require catheterization. In other particulars the after treatment is that of any laparotomy.

To my mind the operation thus described would be ideal and perfect, providing we could select our cases and operate only those depicted in Figures 8, 9 and 10. After the prolapse has become complete, *i. e.*, when the prolapsed anterior wall has drawn down also the two lateral and posterior walls, it may become necessary to add also some sort of a plastic or fixation operation. I have thus far done so in two cases only. I have purposely refrained from doing so because I wished to test the principles underlying my operation.

REPORT OF CASES.

CASE I.—Sophie K., 34 years of age, was admitted upon the First Surgical Division of Mount Sinai Hospital, July 26, 1907, suffering from a rectal prolapse, which had existed four years. Local physical examination revealed a prolapse the size of a fist. July 30th I performed a typical operation. Primary union. Discharged, August 21st. Patient was last seen and examined by me March 2, 1912. The result, after nearly five years, is ideal in every respect.

CASE II.—Marie W., 44 years of age, was admitted upon the First Surgical Division of Mount Sinai Hospital, December 9, 1908. She had been suffering for over fifteen years from the discomforts of a rectal prolapse. Numerous operations had been performed upon the rectum, and finally six years ago sigmoidopexy. The benefit obtained from these operations amounted to nothing, as they were promptly followed by a recurrence of the same dimensions as before operation.

Local physical examination revealed a prolapse the size of a child's head; the sphincters were very much relaxed, easily admitting the entire hand.

Dec. 26, 1908, typical operation. Primary union. Discharged Jan. 30, 1909.

Patient was last seen and examined by me Feb. 24, 1912. The result is an excellent one. Patient considers herself cured; but on extreme straining a narrow rim of mucous membrane just becomes visible.

CASE III.—Elka I., 58 years of age, was admitted November 16, 1908, upon the Second Surgical Division of Mount Sinai Hospital, in the service of Dr. Lilienthal. She had been suffering

from a prolapse of the rectum for a number of years. At first the prolapse was reducible by contracting the levator ani; for the past year it could be reduced only manually.

Local physical examination showed a rectal prolapse the size of an orange.

November 20th Dr. Lilienthal extirpated the entire prolapse after a modified Mikulicz method. An uneventful convalescence followed, but while the patient was still in the hospital a recurrence was noted, and reached a size of three inches.

January 10th, at the request of Dr. Lilienthal (and I gladly avail myself of this opportunity to again express my gratitude for his invitation to operate this case), I performed a typical operation. Primary union. Discharged February 6, 1909.

Patient was last seen and examined by me February 26, 1912. The result is excellent. Patient considers herself cured, but on extreme straining a narrow rim of mucous membrane just becomes visible.

CASE IV.—Fanny P., 42 years of age, was admitted to the First Surgical Division of Mount Sinai Hospital February 4, 1910, complaining of incontinence of fæces, and a prolapse of the rectum, which had existed for three years. Local physical examination showed a rectal prolapse the size of a goose egg, and, in addition, a very large rectocele and cystocele.

February 8th, typical operation. Primary union March 3rd. Hegar perineorrhaphy. Discharged March 21, 1910.

Patient was last seen and examined by me March 5, 1912. The result, as far as the rectal prolapse is concerned, is perfectly ideal; but she has a hernia in the laparotomy cicatrix.

CASE V.—Harry H., 22 years of age, was admitted to the Har Moriah Hospital May 19, 1911, with a prolapse of the rectum, which had existed for sixteen years. Local physical examination revealed the presence of a prolapse of the rectum the size of a goose egg.

May 22nd, typical operation, in the presence of Dr. Hy. Roth. Primary union. Discharged June 9, 1911.

Patient was presented at a meeting of the Surgical Section of the N. Y. Academy of Medicine December 1, 1911. He was last seen and examined by me February 22, 1912. Result ideal in every respect.

CASE VI.—Annie S., 50 years of age, was admitted to the Second Surgical Division of Mount Sinai Hospital September 1, 1911, with a rectal prolapse, which had existed for six months. Local physical examination revealed the presence of a rectal prolapse the size of an orange.

September 6th, at the request of Dr. Charles A. Elsberg (and I take great pleasure in expressing my thanks for his invitation to operate on this case), I performed a typical operation. Primary union. Discharged September 28th.

Patient was last seen and examined by me Feb-

ruary 26, 1912. Result excellent. Patient considers herself cured in every respect, but on extreme straining a narrow rim of mucous membrane just becomes visible.

CASE VII.—Jennie G., 50 years of age, was admitted July 29, 1911, upon the Gynecological Division of Mount Sinai Hospital, in the service of Dr. Brettauer. She had been suffering for over fifteen years from a prolapse of the rectum, and was operated upon repeatedly from the rectal aspect, and once by laparotomy, for its relief. August 1, 1911, she was operated upon by Dr. S. M. Brickner by a modified Bier method. None of these operations were followed by a curative result. On December 20, 1911, she was admitted upon the First Surgical Division with incontinence of the rectum and a prolapse the size of a goose egg. On account of the numerous preceding operations upon the anus, there was practically no sphincter present. After reduction of the prolapse, it immediately prolapsed, even in the recumbent posture; so that the patient never made even the attempt to reduce it.

December 27th, typical operation; primary union. January 10th, Hegar perineal plastic, at which occasion an attempt was also made to reunite whatever fibres of the sphincter still remained. Primary union. Discharged February 14, 1912.

Patient was last seen and examined by me February 24, 1912. Result ideal in every respect.

In connection with these histories, I take great pleasure in incorporating the following letters and histories:

March 4, 1912.

MY DEAR DR. MOSCHCOWITZ:

Enclosed please find the history which I promised to send you. I have examined the patient today and find that he is perfectly well and presents not the slightest evidence of a return of his former disease.

With kindest regards, I am,

Sincerely yours,

(Signed) HENRY ROTH.

CASE VIII.—Hospital No. 34543. Henry F., 25 years old, bookkeeper by occupation, was admitted to Lebanon Hospital on August 30, 1911, and gave the following history: For the past eighteen years he has suffered from severe rectal tenesmus. During defecation he feels a large protrusion of the rectum. There is a passage of blood and mucous every time he has a bowel movement. The protruded bowel must be replaced to allow the escape of feces. He was operated upon for prolapsed rectum three years ago, and again one year ago. In both instances the operation consisted in cauterization of the prolapsed bowel. He obtained very little relief from these operations. Shortly before his admission to the hospital he passed through an illness, which presumably was an attack of appendicitis.

On physical examination slight tenderness was elicited in the right iliac region. On straining, the rectum was readily prolapsed, the protruding mass being about six inches long and bluish-red in color. It bled on the slightest touch. The

patient was quite anæmic, but fairly well nourished.

Operation by Dr. Henry Roth on September 6, 1911. Cœliotomy slightly to the left of the median line. Trendelenberg position, pelvis cleared of all intestine except sigmoid, which was pulled up as far as possible. The recto-vesical cul de sac was then obliterated by a series of purse-string sutures of Pagenstecher linen thread, according to the method of Dr. A. V. Moschcowitz. Appendix showed evidence of recent inflammation and was therefore removed. Layer suture of abdominal wall. Had post-operative pneumonia which ran a mild course.

Discharged cured September 28, 1911.

DEAR DR. MOSCHCOWITZ: February 28, 1912.

If there are any other facts in regard to the cases which you wish to know, please let me know.

Very truly yours,

(Signed) CHARLES H. PECK.

CASE IX.—Mrs. E. P.; 45 years; married; housewife; was admitted to the Roosevelt Hospital, November 6, 1911, suffering from complete prolapse of the rectum, which on straining protruded several inches beyond the anus. All coats were included in the prolapsed portion.

The patient was emaciated and debilitated, and as the sequel proved, in no condition to be subjected to any major operation. The operation of obliteration of the cul de sac was performed on November 13, 1911, through a median laparotomy wound. The cul de sac was very deep and the tier sutures of catgut were carried well up on the body of the uterus. The result seemed very satisfactory in keeping the small intestines out of the depths of the pelvis, and in anchoring the mesorectum to the lateral pelvic walls. The operation was apparently well borne, but suppression of urine developed and the patient died on November 20th, seven days after the operation.

Autopsy showed the sutures holding perfectly the small intestine well up out of the depths of the pelvis, and what seemed effective anchorage of the rectum. Careful examination for possible inclusion of a ureter in the suture showed that both were free and uninjured.

Death was due to causes not connected with the operative procedure, and would have undoubtedly followed any major operation.

The conception of rectal prolapse, in complete cases, as a hernia of the pelvic contents, the sac of which is the cul de sac of Douglas, seems to me a most rational one, and obliteration of the cul de sac by sutures is well worthy of a trial as a means of cure.

RESULTS.*

A total of nine cases were operated upon thus far by this method. On account of the fatal issue of Case 9 there are available only eight

* Since the writing of this paper I have had occasion to operate four further cases of "Prolapse of the Rectum," with uniformly good results.

cases for the purpose of estimating the ultimate outcome.

The final results may be judged from two viewpoints: that of the patient and that of the surgeon. It is surprising that in this instance the patient is better satisfied than the surgeon. In fact, from the patient's viewpoint the cures may be estimated at one hundred per cent.

From the hypercritical surgeon's viewpoint, however, I would say that only five cases (Cases 1, 4, 5, 7 and 8) may be considered cured, not only symptomatically, but actually anatomically. By this I mean that in these five cases there is not even on greatest straining more of the mucous membrane of the rectum visible than is normal. In the remaining three cases (Cases 2, 3 and 6) I estimate the percentage of the cure at about 90. In other words, under normal conditions, for instance, during defecation or coughing, there is absolutely no deviation from the normal; but when the patient strains his utmost the anus opens up so that a narrow rim of the mucous membrane is just visible. I am of the firm opinion that even this can be corrected by the addition of a small plastic in the cases indicated.

PREVIOUSLY DESCRIBED OPERATIONS COMPARABLE TO THE ONE JUST SUBMITTED.

My studies on prolapse of the rectum date back six years. The first operation done by the method which I described was performed July 30, 1907; the last was performed December 27, 1911. Appreciating the fallibility of any operation for prolapse of the rectum, which has not stood the test of a long period of observation, I refrained from publishing this operation previously. I would not have done so even at present had not an eminently successful case which I presented at the New York Academy of Medicine stimulated our honored chairman to invite me to present my observations at this meeting.

Up to a few months ago I was under the impression that both, my ideas and my operation, were original with me. In the course of preparation of this paper, I discovered that Quenu and Duval³⁴ in 1910 published a method in which two sutures are placed circularly in the cul de sac of Douglas. A more extensive search of the literature brought to light that Bardenheuer³⁵ and Samter³⁶ in 1902 advocated a similar procedure. While all these writers divined the essential principle of the operation for the cure of prolapse of the rectum, their understanding of the true pathology of the malady is not altogether perfect, inasmuch as they all recommend colopexy as a principal part of their operation. My contention is furthermore substantiated by the paucity of the theoretical aspects of the subject in their publications. In fact, there is not one satisfactory, systematic exposition of the true anatomy and pathogenesis of prolapse of the rectum in literature.

Indeed, it is surprising that the operation was not conceived before, in view of the highly sig-

nificant investigations of Waldeyer upon the anatomy of the pelvis, published in 1899. A careful perusal of the work suggests such an operation almost intuitively.

However, the question of priority of this operation is not a matter of profound importance. My main purpose is a desire to throw light on a subject which has commanded only superficial attention, and to interest you in an operation which brings relief to a class of patients that have hitherto obtained little or none.

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SURGICAL CONSTIPATION.*

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CLINICALLY, there are four types of constipation—psychic, spastic, atonic and surgical or mechanical, but I will confine discussion to the last named, or surgical variety.

Surgical constipation, or more correctly speaking, obstipation, is characterized by delayed, insufficient and imperfect evacuations consequent upon pathologic and anatomic abnormalities or foreign bodies which block the bowel, modify its lumen of check peristalsis, mechanical defects which require operative measures for their correction.

Habitual or atonic constipation is frequently discussed in medical societies and has been extensively written about in medical journals; and acute and the severer types of chronic obstruction which kill or endanger the patient's life have received full consideration in the standard works on surgery. On the contrary, mention is rarely made of mechanical constipation or obstipation, where there is sufficient bowel blocking to impede the fecal current without causing distress other than that consequent upon irregular evacuations and fecal retention.

I am unable to understand this lack of interest in obstipation, which is quite common, usually easy to diagnose, and can be treated with extremely satisfactory results.

I treat nearly as many patients for surgical as for atonic costiveness, and it is natural that I should see more of these cases than the general practitioners, but allowing for this, I am convinced that obstipation is very much more common than is supposed, and believe that 25 per cent. of all persons afflicted with constipation suffer from the mechanical or surgical variety. In hundreds of instances patients previously treated without benefit for habitual costiveness have been quickly cured by removing impediments to the fecal current, which indicates that obstipation is frequently mistaken and treated for atonic constipation.

Etiology.—When one remembers that the colonic feces are semi-solid or formed, considers the construction of the bowel, and notes the many points of difficult passage to the feces, as, for instance, the irritable sphincter, tube-like anal canal, forked levator ani muscle, upward projecting rectal valves, narrow angulated recto-sigmoidal juncture, swing-like sigmoid flexure, with its short mesenteric attachments, sharp and angulated splenic and hepatic flexures, dependent transverse colon, and dilated movable cecum, one marvels as to how the movements occur when the intestine is normal and ceases to wonder why constipation ensues when the bowel contains foreign bodies or is even slightly deformed, misplaced or diseased.

Many physicians are inclined to attribute the average case of costiveness to a single cause, when in most instances there are two or more factors that participate, as represented by sluggishness of the intestine, mechanical defects, or both.

My experience indicates that many patients suffer simultaneously from atonic constipation and obstipation and require a dual treatment, and that either condition may aggravate or induce the other.

At one time or another I have operated to relieve surgical constipation induced by, viz.:

1. Congenital deformities of the colon, sigmoid flexure, rectum and anus.
2. Foreign bodies.
3. Intestinal calculi (enteroliths).
4. Coprostasis (fecal impaction).
5. Seed, fruit, stone and chemical impactions.
6. Sequelæ following operations.
7. Kinking at the ileocecal angle (Lane's) or recto-sigmoidal juncture.
8. Sacculations of the colon and sigmoid flexure.
9. Adhesions, exudative, bandular and fan-shaped.
10. Angulations and flexures.
11. Diverticula.
12. Chronic volvulus.
13. Chronic ileocecal, colonic and sigmoidal invagination.
14. Chronic incarcerated hernia.
15. Abnormally short and long mesenteries.
16. Extraintestinal pressure, induced by adhesions, tumors, uterine displacement and enlargement of the prostate.
17. Splanchnoptosis and coloptosis.
18. Congenital and acquired dilatation of the colon (megacolon, Hirschsprung's disease).
19. Enterospasm.
20. Obstruction by intestinal worms.
21. Stricture.
22. Malignant and non-malignant neoplasms.
23. Hypertrophy of O'Beirne's sphincter.
24. Bifurcated rectum.
25. Hypertrophy of the rectal valves.
26. Hypertrophy of the levator ani muscles.
27. Hypertrophy of the sphincter ani.
28. Rectocele.
29. Deformities of the coccyx.
30. Narrow anal canal.
31. External and internal hemorrhoids.
32. Ulcers, simple, specific and chancroidal, which excited sphincteralgia.
33. Fissures.
34. Polyps.
35. Blind fistulæ.
36. Short band-like folds of skin extending across the anal margin.

In many instances interference with the fecal current was slight and in others marked, and in some cases the blocking was induced by a single and in others by a number of defects

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

wherein the lesions were situated within the abdomen, rectum, or both.

I have found it convenient to group my cases as rectal when the obstruction is in the terminal bowel, abdominal when the block is in the belly, and recto-abdominal obstipation when the lesions are located in both regions.

In rectal obstipation usually the lesions (fissures, ulcers, hemorrhoids, etc.) are located within the anal canal and cause painful defecation, sphincteralgia, or block the bowel, but when the obstruction is situated higher up, ordinarily it is induced by hypertrophy of the levator ani muscle, or rectal valves, carcinoma, or stricture.

That rectal affections commonly cause obstipation is evidenced by the fact that most patients when cured of them say that their constipation has also been relieved.

Symptoms.—In addition to frontal headaches, sallow complexion, furred tongue, foul breath, anorexia, nervousness, disturbed dreams, lassitude, vertigo and other manifestations common to the atonic form, patients afflicted with surgical constipation frequently suffer from indigestion, gas accumulations, occasional colic, localized tenderness, sensation of bowel blocking at a definite point, sometimes alternating diarrhoea and constipation, now and then fragmentary or misshapen stools, and when the obstruction is in the rectum a feeling of weight, fullness, and a frequent desire to stool.

Diagnosis.—The diagnosis of rectal obstipation is easy and in most cases there is no excuse for a mistaken diagnosis because the abnormalities responsible for the obstruction, painful defecation, or sphincteralgia can be seen by inverting the anal margin or through the proctoscope, and can be felt with the finger, except where the block is located in the upper rectum.

Abdominal surgical constipation is more difficult to diagnose, and considerable ingenuity and patience are required to locate the cause of the trouble in obscure cases, and in many instances the nature of the disturbance is not discovered until the patient has been constipated for months or years and the lesions interfering with the fecal current have assumed alarming proportions.

In cases of chronic obstipation it is necessary to ascertain its duration if congenital and whether or not it followed an attack of typhoid fever, appendicitis, peritonitis, pelvic inflammation, ulcerative colitis, or an operation which might have left adhesions or other obstructing sequelæ.

Examination of the gut is necessary both prior and following defecation, because when the rectum is filled with feces it shows that the block is low down and when empty and the patient has not had a movement for one or more days it indicates a block in the sigmoid or higher up. Enemata are a helpful diagnostic aid because when a half pint of water causes an evacuation it demonstrates that the trouble is in the rectum, but in cases where one, two, three or more

quarts are required it points to a high-lying obstruction.

Again, when the bowel is normal copious enemata are quickly voided, but in the presence of coloptosis, enterospasm, angulation, volvulus or invagination they may be retained for hours or be evacuated in spurts.

Obstructive lesions in the upper sigmoid, colon and cecum can frequently be located by percussion, which reveals backed-up gases and feces, or by tracing the gut upwards to the block following inflation, but I have found palpation more serviceable because with it tender and painful spots, tumors, fecal impactions, a dilated colon, or the thickened gut can usually be defined, and upon pressure over the lesion the patient will suddenly say that the block is there.

When the diagnosis remains in doubt the colon should be X-rayed or an exploratory incision should be made. Obstructions situated in the lower sigmoid or rectum can be located and inspected by procto-sigmoidoscopic examination.

Bougies are dangerous and should never be employed for diagnostic purposes when the obstruction is three inches or more above the anus because of the danger of rupturing the bowel and causing peritonitis.

In cases of obstipation caused by narrowing of O'Beirne's sphincter or sharp angulation at the recto-sigmoidal juncture the bowel is never empty and the sausage-shaped sigmoid can be felt resting in the recto-vesical or Douglas' pouch when digitally examined through the rectum or vagina.

When the block is caused by invagination of the sigmoid flexure into the rectum the abnormality can be detected by introducing the sigmoidoscope and gradually withdrawing it as the patient strains, when the telescoped gut can be seen following the instrument downward almost to or through the anus.

Treatment.—Drugs, psychotherapy, exercise, massage, vibration and hydrotherapy, effective in atonic, are useless before, but are helpful following, operations for the relief of surgical constipation.

Patients suffering from both obstipation and ordinary constipation first require an operation to correct the former, and thereafter a lubricating oil or a tonic pill and physical therapeutic measures to restore tone to the bowel. In this class of cases it is impossible to foretell whether post-operative treatment will be required or not, and because of this I inform my patients beforehand that immediate relief may follow or it may be necessary to continue the treatment afterwards.

Patients are taught that the color, consistence, shape and quantity of the fecal discharge vary in health, disease, and with the diet, that they may not be disappointed in case the stools do not meet their expectations.

In deplorable cases of obstipation complicated

by auto-intoxication or intestinal catarrh, appendicostomy or cecostomy have been frequently resorted to simultaneously with removal of the obstruction, so that through and through intestinal irrigation might be instituted and the period of convalescence shortened.

English surgeons claim to have overcome constipation by appendicostomy, but this procedure should be regarded as palliative and not curative, since it enables the patient to flush and clear the bowel of feces, but does nothing toward removing the cause of the trouble.

Following operation, the patient on the third day is permitted a full tray and is given liquid paraffin, olive, sweet, almond or cotton-seed oil daily in tablespoonful or larger doses to lubricate and stimulate the bowel.

Operative Measures Indicated in the Treatment of Surgical Constipation.—The surgical procedures for the correction of obstipation are so many and varied that their full consideration is impossible in the time allowance for this paper.

Abdominal Constipation.—The procedures employed for the correction of congenital deformities vary according to the location and character of the malformation. When the colon or sigmoid flexure is misplaced, twisted or angulated, it should be freed and anchored in its normal position; when too short and ending in a blind pouch, an artificial anus is indicated, and when strictured or blocked by a membranous partition, resection is preferable. When the anal canal is narrow or its terminal extremity is partially or completely blocked by membranous or fibrous tissue, free incision and digital dilatation give good results, but where the rectum terminates in a blind sac above the anus, the desection should be carried upward until it has been isolated and the operation completed by opening and suturing it at the anal region, taking opportunity to close existing fistulæ at the same time.

The operative treatment for obstructive adhesions must be changed to meet the indications; exudates which weld the viscera together are broken up by wiping the intestine loose with gauze, fibrous bands are severed with knife or scissors, but when adhesions are numerous, broad or fan-shaped, they are freed by dissection while in plain view, after which raw surfaces are covered with peritoneum and sterile oil is introduced to prevent their reformation.

Kinks, angulations and twists are treated in the same manner, except their peritoneal attachments are severed when short or contracting and in cases where anchoring of the gut to the abdominal wall is necessary.

Obstipation consequent upon coloptosis or invagination of the sigmoid flexure into the rectum is easily corrected by colopexy or sigmoid-apexy, but care should be taken to prevent twisting or angulation of the gut.

Blocking from extra-intestinal pressure is overcome by anchoring or removing the uterus,

replacing offending viscera, extirpating tumors, or correcting adhesions or other lesions which press upon or constrict the intestine.

Strictures and cancers involving the abdominal gut are resected or relief is obtained through the establishment of an artificial anus in inoperable cases.

Chronic incarcerated hernia is dealt with according to its character and location.

Surgical constipation secondary to either congenital or acquired dilatation of the colon is invariably improved and sometimes cured by scari-fying, plicating and suturing the enlarged and ptotic colon in its normal position, or in deplorable cases by severing the ileum, closing the divided extremities by purse-string sutures and anastomosing the proximal end with the rectum or sigmoid flexure (ileorectostomy, ileosigmoidostomy), a procedure which leads to contraction and renewed vigor of the bowel.

Sacculations which weaken the colon and serve as collecting places for impacted feces are obliterated by infolding sutures and diverticula by excision and closure of the intestinal opening.

In extreme cases of congenital deformities, coloptosis, dilatation of the colon, adhesions, angulations, kinks, twists, pericolicitis, with formation of Jackson's membrane, and other conditions wherein the bowel is irretrievably incapacitated, the colon should be excluded by ileo-rectostomy (ileo-sigmoidostomy), or extirpated. I employ appendicostomy or cecostomy in connection with colonic exclusion so that the colon may be kept clean and auto-intoxication diminished.

Following both complete exclusion and extirpation of the colon the patient at first has several fluid or semi-solid movements daily, which gradually diminish in frequency until at the expiration of six weeks to three months the stools become regular and of normal consistence.

Rectal Constipation.—Fortunately most of the defects responsible for rectal obstipation can be corrected under local, but general anæsthesia is indicated in cases where the operator is in doubt as to the character and amount of work to be done. Following infiltration with a one-eighth per cent. eucaine solution, skin-tags are snipped off, thrombotic piles are incised and packed after evacuation of the clot, and internal hemorrhoids are removed by the ligature method. Fissures, ulcers and irritable sphincters are treated by division of the anal muscle and drainage, which is preferable to divulsion, since the latter will be unsuccessful when the sore fails to heal before the muscle regains its tonicity.

Obstructing rectal valves are divided with a Gant clamp, the adjustment of which requires but a moment and is done without anæsthesia.

Obstipation consequent upon hypertrophied levatoris ani is corrected by eucainising the rectal wall and deeper structures, dividing the bowel and muscle on one or both sides from within, serving them from the coccygeal tip

by subcutaneous tenotomy and myotomy, or in obstinate cases by removing two or three segments of bone and freeing the rectum from its levator ani attachments.

Rectal strictures below the peritoneum are sometimes divulsed when slight, but in more severe cases internal or external proctotomy is performed, but when stenosis is almost complete, a controllable artificial anus is made or the gut is extirpated and the proximal end, according to indications, anchored to in the inguinal or anal region.

Benign and malignant tumors in the lower bowel are extirpated.

Polyps within the anal canal are infiltrated, ligated and excised, but when higher up a Gant clamp is snapped upon their pedicle and they are permitted to slough off.

Fistulæ responsible for painful defecation and sphincteralgia are eucainized, divided and drained.

Unattached segments of the coccyx which encroach upon the rectum are almost bloodlessly excised in three minutes with heavy, blunt-pointed scissors.

Intestinal Calculi.—Foreign bodies in the rectum can be removed with the fingers or with forceps through the proctoscope, but when large or cause great pain, this is preceded by divulsion or division of the sphincter.

Impacted fecal masses are broken up with the finger or through the proctoscope, using a gauge, and then softened and dislodged by irrigation. When located in the colon repeated copious high enemata containing soapsuds, oil, or turpentine in conjunction with massage, are effective in bringing the masses into the lower bowel where they are removed in the manner just described. In chronic cases the injection of hydrogen peroxide causes breaking up of the impactions and minimizes the symptoms of auto-intoxication.

A rough estimate of my statistics in the last 500 operations performed upon adults for the correction of surgical constipation shows that the lesions were rectal in 65 per cent., abdominal in 20 per cent., and recto-abdominal in 15 per cent. of the cases. In 50 per cent. the evacuations became normal almost immediately without artificial aid; in 35 per cent. they became almost or regular within a month through the consumption of suitable food, fruit laxatives, or liquid paraffin, but the remaining 15 per cent. did not do so well and required a systematic treatment, including hydrotherapy, massage, exercise, vibration or dieting for from one to three months to reinvigorate the atonic gut and improve their mental and physical condition.

In so far as I have been able to determine, the majority of these patients were permanently cured, others remained well for a considerable time and then relapsed slightly, while in about 10 per cent. there was little or no permanent improvement.

Failures and relapses were attributed to undiscovered causal factors, development of complicating diseases, formation of adhesions, irregular manner of living, or carelessness of the patient in carrying out instructions, sequelæ following the operations, or intestinal atony.

The above percentage of cures and improvements will appear high to physicians who frequently treat atonic constipation and see little of obstipation, but the results are no better than they should be, considering the character of the rectal and abdominal lesions responsible for surgical constipation. Barring extensive resections for stricture and cancer, the mortality following operations performed for the relief of mechanical constipation has been almost nil and in cases where deaths have occurred the obstructive lesions were situated in the abdomen.

In 250 cases necessitating celiotomy there were three deaths, one from paralytic ileus following the breaking up of extensive adhesions and sigmoidopexy for invagination; another from heart complications as the patient was leaving the hospital three weeks after operation; and the third from peritonitis following colopexy and appendicostomy, practised to relieve coloptosis and auto-intoxication, where an assistant mistook an opening in the wound for that of the appendiceal outlet and injected the irrigating fluid directly into the abdomen.

The mortality is higher in cases of intestinal stenosis and carcinoma requiring resection, but these conditions ought not to be grouped with the less dangerous bowel defects responsible for obstipation.

In addition to the above, I have elsewhere² published the records of 106 operations performed upon children for the relief of obstipation, whose ages varied from infancy to 12 years, and of this number 62 were males and 44 females. The results show a cure in 66, improvement in 26, no improvement in 10, and that death occurred in four instances.

The cause of obstipation was located in the ano-rectal in 70 and in the abdominal region in 36 cases, and in the *ensemble* 35 types of obstruction or mechanical defects figured as causative factors in the obstipation. These infants and children were constipated, but not all were brought to me for that condition, since a number were afflicted with fissures, strictures, polyps, congenital deformities, thrombotic hemorrhoids, narrow or other ano-rectal or abdominal affections, the correction of which served the double purpose of relieving their distress and curing constipation.

In conclusion I wish to state that my experience in more than 500 cases has convinced me that surgical constipation is a common affection, is usually easy to diagnose, and that the permanent results effected by its surgical treatment are very much better than those which fol-

low the therapeutic measures employed in the treatment of atonic constipation.

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Discussion.

DR. DWIGHT H. MURRAY, Syracuse: As to constipation and its surgical treatment, the first thing is to examine the patient. This Dr. Gant has gone over, but it should be emphasized. The tendency among physicians is not to examine, but to give a prescription containing some laxative and to order enema and things of that sort. There are three causes for these cases of constipation, namely, ignorance, carelessness and laziness. I disagree with Dr. Gant, who spoke of troubles with the valves, muscle hypertrophy and such causes of constipation. Primarily, they are results and not causes, but later they, in turn, may become the cause of continued constipation. Ulcers may be caused by a spiculum of bone in the feces making an abrasion, or a large mass of feces causing a tear in passage. The cause for a tight sphincter is ulcer or some palpable lesion. Unless one removes this cause he may cure, but again, he may not. Constipation is the cause of more invalidism than any other thing in the whole category of human ills. Even gall-bladder troubles that have just been discussed may be traced indirectly to constipation as the cause. In the surgical treatment Dr. Gant did not mention Lane's operation, or the removal of the whole or a part of the large intestine, fastening up the transverse colon in correcting angulation, etc. This was probably owing to lack of time.

I want to emphasize my plea for a more thorough examination of the rectum by the general practitioner. One should find out whether the patient is constipated. Many neglect to ask the patient whether he drinks enough water. Examination of the rectum is easy. The medical colleges of the United States are largely at fault because they do not teach rectal diseases except as a branch of general surgery. I have received letters from twenty-six colleges on this subject and many of them said they did not think it was necessary to teach proctology except as a branch of general surgery. I wrote to 110 physicians who had been in practice for five years or more, and asked them if they thought they had enough knowledge on this subject to be of real service to their patients, and also if they would not have done better work if they had had better training in this branch. They all answered "No" to the first question, and "Yes" to the second. There is no other one thing by which they can do as much good for the patient as by knowing the fundamental things about the rectum.

I wish to thank Dr. Moschowitz for his paper, but I think the operation is more dangerous than

an amputation. If the results are better, however, it is worth a trial.

DR. HENRY ROTH: I wish to endorse what Dr. Moschowitz has said, although my experience is limited to one case. This patient had a prolapse for eighteen years, was an invalid and suffered constantly. He had had two previous operations, but is now absolutely well. The prolapse was six inches in length. The operation is not dangerous, and practically bloodless. Aside from caring for the ureters and large vessels, it is simple. I have put the same question to my patient that Dr. Moschowitz has done, as to whether he would be willing to submit to the operation again if it were necessary, and I received the same reply, namely, that the relief has been so great that he would willingly undergo the operation again.

It is a mistake to include intussusception, the only thing it has in common with prolapse being that something comes out of the rectum. The symptomatology and pathology are different. Another condition that should be excluded is so-called prolapse of the anus.

GALL STONES.*

By PARKER SYMS, M.D.,
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THOUGH gall stones are of very common occurrence, and though they give rise to a distinct train of symptoms, their importance and significance are scarcely recognized. This has been a great misfortune to humanity, and has been a reproach to the medical profession. Fortunately, our knowledge of this subject is receiving wider recognition by medical men, and a decreasing proportion of gall stone sufferers are left to neglect and consequent disaster. For early recognition and early operation are the main factors of success in the treatment of gall stone diseases.

Gall stones are more common in women than in men. Of course the proportion will vary according to different statisticians but it is undoubtedly true that they are found three or four times more frequently in women than in men. They are rare in youth, and belong more particularly to the middle period of life. They seldom exhibit symptoms before the twenty-fifth year. The commonest time for their manifestations is between the thirtieth and the fiftieth year. More than 75 per cent. of cases occur after the twenty-fifth year of age. In a large proportion of cases they give rise to only trivial symptoms, and they are not usually recognized until they have existed for a long time. The symptoms that are recognized as classic indications are unfortunately manifested in a minority rather than a majority of cases.

Gall stones are always the result of infection.

* Read at the annual meeting of the First District Branch, at Poughkeepsie, October 4, 1912.

They depend for their formation on a change in the character of the bile. They result usually from an inflammation of the gall-bladder or the bile ducts coincident with two things, that is to say, a stagnation of the flow of bile and a change in the character of the bile. They frequently if not usually are formed around a nucleus. This nucleus may be merely a mass of thickened bile or a mass of mucus or some epithelium which has been shed during the process of inflammation. These nuclei may be made up of casts of some of the small ducts which have been washed into the gall-bladder or into the larger bile ducts. These casts are the result of what Mekel called Lithiatic catarrh.

As said above gall stones are always the result of infection. This infection may be due to one of a large variety of pathogenic bacteria, or there may be a mixed infection. As in all infectious lesions of the alimentary tract the colon bacillus play a very important part. This is true also of the bacillus of typhoid fever. Living typhoid bacilli have been found in the center of gall stones which have existed for many years. These typhoid bacilli have been found in cases where there has been a distinct history of an attack of typhoid fever, and they have also been found in cases where such a history has been entirely wanting. Of course staphylococci, streptococci and other forms of pyogenic bacteria are frequent causes of inflammation of the biliary tracts and thus become the cause of gall stones.

Much has been written of the mode of access of the bacteria to the biliary passages. Undoubtedly this invasion takes place by three different avenues. (a) By direct ascent from the duodenum through the common duct. (b) Through the lymphatic system. (c) Through the portal system. Doubtless infection through the portal system is the most common.

The mechanism of gall stone production is really dependent upon morbid changes in the character of the bile. These changes in the character of the bile are dependent upon corresponding changes in the mucosa of the biliary passages. In other words they are dependent upon inflammation of the mucous membrane, the result of infection. McCarty has classified the various forms of inflammation, but he has pointed out that this variety is really one of stages and degree rather than of special forms of lesion. He has also shown that the character of the bile corresponds with the stage of the inflammatory process.

The very acute cases are not the ones that form stones, it is the chronic, long continued inflammation that produces gall stones. They are a matter of comparatively slow growth, dependent on the fact that the bile has been in an abnormal condition, and in a state of more or less stagnation for a considerable time.

Gall stones may form in any part of the biliary

system, but undoubtedly the majority find their origin in the gall-bladder. This is natural, for the gall-bladder is a reservoir for the bile, and when stagnation takes place the bile will be at rest in the gall-bladder more than in any other part of the biliary system, and the formation of stones can most readily take place in that situation.

In studying the etiology of gall stones, one should bear in mind the fact that there is a close association between the liver with its biliary system, the stomach, the intestines, and the pancreas. This is true embryologically, histologically and physiologically; it is also true pathologically.

(Later on I wish to speak particularly of the associated symptoms of diseases of the biliary system, of the stomach and of the appendix.)

There is no doubt that inflammation of the duodenum may extend and produce an inflammation of the common duct and of the entire biliary tract. Of course, if this is true, duodenal ulcer becomes a causative factor in the formation of gall stones. Anything that disturbs the function of the duodenum, resulting in irritation of that organ, causing spasm or congestion or swelling of its mucous membrane, may result in obstruction to the outflow of bile through the common duct. It will be readily seen that such a retardation in the flow of the bile may favor the formation of gall stones, provided this bile has been infected and is in an abnormal condition of viscosity. Chronic appendicitis will cause just such disturbance of the functions of the pylorus and of the duodenum. Thus chronic appendicitis may become a causative agent in the production of gall stones. Of course what has been said of duodenal ulcer in this connection is also true of gastric ulcer, but not to the same extent.

SOME RESULTS OF GALL STONES.

Having considered thus briefly the causation of gall stones, let us turn our attention to some of their effects.

Gall stones may produce infection and inflammation of the biliary tracts; may produce inflammation of the liver, may produce adhesions, involving any of the organs in the region, resulting in deformity, obstruction and impaired function of any of these organs; they may result in ulceration or gangrene of the gall-bladder or bile ducts; they produce pancreatitis, acute, sub-acute or chronic; they may be productive of glycosuria, hence a form of diabetes. And last but not least they are the most potent cause of cancer of the biliary system. In fact, gall stones are a pre-cancerous condition.

While gall stones are known to be caused by infection and inflammation, it is equally true that they tend to provoke further infection and to keep up and produce inflammation. The so-called latent gall stone, doing no harm, does not

exist. A gallstone is always productive of more or less harm. It produces at least a mild form of inflammation and irritation. At any time it may set up a most violent and destructive inflammatory process.

The inflammation may be confined to the mucosa, and the symptoms produced may be mild. Or the inflammation may extend to the peritoneal surface, and thus be communicated to any or all of the organs in this region. The peritonitis may result in adhesions which will more or less cripple the organs involved. For instance—adhesions due to gall stone—peritonitis may involve the duodenum, the pyloric outlet of the stomach, the pancreatic duct, or any portion of the intestine, and may more or less completely interfere with their functions. A stone lodged in the cystic duct may incite an inflammation sufficient to cut off the blood supply of the gall-bladder thus producing gangrene. Of course gall stone may incite a phlegmonous inflammation, resulting in gangrene.

By long irritation gall stones frequently result in cancer. This is particularly true of cancer of the gall-bladder. Cancer of the gall-bladder is said to be preceded by gall stones in 95 per cent. of cases.

Mayo-Robson claims that bile is an excretion and not a secretion. He has demonstrated that there is a normal flow of $27\frac{1}{2}$ ounces in twenty-four hours. When gall stones are so situated as to form a complete obstruction, resulting in chronic jaundice, they cause a serious and dangerous poisoning of the system. By constant absorption of bile, the blood is degenerated, resulting in a form of hæmophilia and the patient is liable to uncontrollable and fatal hemorrhage.

Gall stones may incite a chronic hepatitis, a form of cirrhosis.

Gall stones are frequently the cause of chronic pancreatitis, and occasionally of acute phlegmonous pancreatitis.

It is a well-established fact that infection may be transmitted to the pancreas from the bile passages. This is particularly liable to occur when there is a stone impacted in the common duct. Mayo-Robson claims that 60 per cent. of his cases of common duct stones show a condition of chronic pancreatitis. In about two-thirds of individuals the terminal portion of the common duct passes through the head of the pancreas. The ducts of the pancreas are sometimes two, sometimes there is but one. The main pancreatic duct, the duct of Wirsung may be compressed by a stone in the common duct. If that is so the integrity of the pancreas must depend upon the existence of a secondary duct, the duct of Santorini. Deaver claims that pancreatitis is generally caused by extension from the biliary tract through the lymphatics. In those cases in which the common duct passes through the pancreas jaundice may come on as a result of swelling of the pancreas with com-

pression of the duct. In our operative treatment of gall stones pancreatitis as a complication must be borne in mind for it renders drainage essential to a complete cure.

A careful study of the pathology of gall stone disease will show that the complications just enumerated and touched upon are all dependent on a more or less advanced stage of the processes. In other words the early pathology of cholelithiasis is a simple one, the late pathology is a complex one made up of various complications. This should have very important influence upon our treatment of these cases for early cure may be accomplished by means of simple operative procedure involving the patient in but slight risk and promising an almost certain cure, while late operations are usually more and more complicated, depending on the length of the delay. Therefore the risk to the patient is greater and the prospect of complete restoration to health is less certain.

DIAGNOSIS.

The symptoms produced by gall stones will vary considerably, in their intensity, in their variety and in their importance and they will correspond very closely to the lesions which they represent. Unfortunately the clear cut classic picture of gall stone colic is rare rather than common, and unfortunately the public and the majority of the medical profession hold the mistaken view that the less severe symptoms which are usually found do not point out serious danger and do not necessarily call for surgical relief. There has been a mistaken idea in minds of our profession that in the majority of cases gall stones do not cause symptoms. This is not so, for it is equally true that a gall stone is always doing more or less harm and that a gall stone will always produce more or less well-marked symptoms. The fact that they are so frequently overlooked is owing to indifference on the part of the patients and to ignorance on the part of their physicians.

Some cases present classic textbook pictures. In these the diagnosis is simple. The cardinal symptoms are acute violent pain coming on suddenly, usually at night; this pain is stabbing, lancinating in character, and it radiates to the back and right shoulder. There is usually tenderness, sometimes very acute in the region of the gall-bladder. Frequently there is vomiting and if the attack lasts for a day or two there may be jaundice. The attack may be ushered in with a chill or there may be a succession of chills. Such cases present but little difficulty in diagnosis.

The vast majority of cases are not manifest by a severe and characteristic attack and diagnosis is not forced upon us but it should always be made if we pay attention to the whole picture of the case and if we hold the view that chronic indigestion and dyspepsia are not normal conditions. In the majority of cases the gall stones

are at rest and are not causing active and violent irritation. The gall-bladder and bile ducts are chronically but not acutely inflamed. Symptoms will correspond to these conditions and will be those of a slight localized irritation, of a slight inflammation of a chronic type and of a slightly disturbed function on the part of the digestive tract. They are mostly those of a chronic dyspepsia, not violent in character. Such patients will have sour eructations, belching of gas and a sense of fullness and tension after eating. They may have slight pains, slight tenderness and rigidity at the Mayo-Robson point. They usually suffer from constipation. These are the cases where diagnosis is certainly not easy. In some the diagnosis must be inferred. These patients should be carefully watched and if their symptoms are sufficient to disturb their health, to undermine their nervous system or make useless or unhappy their lives they should certainly be operated upon, assuming that they have had careful hygienic treatment without success.

Let us here consider the co-relation of certain diseases of the stomach, the biliary tract, and the appendix. There are many cases which present symptoms of dyspepsia or chronic indigestion in which it would be impossible to say whether the lesion is in the appendix, in the bile passages, or in the pylorus or duodenum. These cases are to my mind of the utmost importance, and yet the vast majority of them are neglected by the medical profession. They are cases in which there is a vague sense of distress in the right upper quadrant of the abdomen, acidity of the stomach, eructation, and belching of gas, slight tenderness over the region of the gall-bladder, a sense of distension or upward pressure, sometimes irregular looseness of the bowels, usually constipation. Now if such patient does not show an active attack of appendicitis with localized pain, tenderness and rigidity or a classic attack of gall stone colic with a violent pain radiating to the back or shoulder, with vomiting, chills and jaundice, or the positive evidence of gastric or duodenal ulcer made up of violent pain, vomiting and hemorrhage, I say, if such a patient does not show such a positive and unmistakable evidence of one of these conditions, he is almost invariably neglected by his physicians; and yet I maintain that every such case of incurable indigestion is due to one of these three diseases, namely, peptic ulcer, gall stones, or chronic appendicitis. And I also maintain that every one of these patients should be cured. Gastric and duodenal ulcers may be cured by a medical treatment in a certain proportion of cases, when they are not thus cured and permanently cured they should have surgical relief. Chronic appendicitis and gall stones are never cured by any except surgical means.

INDICATIONS FOR OPERATION.

To my mind the mere diagnosis of gall stones is sufficient to warrant an operation. This

opinion is based on the fact that all gall stones are doing more or less harm. In these cases the early pathology is much more simple than is the late, and if we operate during the early stages we shall be able to accomplish the necessary object by means of a simple and safe procedure and the chance of radical and permanent cure is much greater than it would be if we wait until complications have set in. Nearly all complications are the result of delay. All things being equal the death rate of biliary surgery bears a distinct relation to the period of the disease. Deaver aptly says that a low mortality rate obtained by a surgeon is a tribute to the knowledge and skill of his medical confreres who sent him cases. Most of the mortality in biliary surgery is due directly to delay. Prolonged jaundice is the cause of fatal hemorrhage. Extensive adhesions add greatly to the seriousness of the disease. Cancer is produced by delay—by prolonged irritation.

If we concede that a certain number of cases of cancer are the result of gall stones and if we concede that removal of gall stones before they have produced cancer will be a means of preventing a certain number of cases of cancer, then we must concede that the mere presence of gall stones is sufficient to warrant operation, for this reason if for no other.

Now of these cases in which the symptoms are not distinct and the diagnosis is not clear I do not wish to be understood as advocating operation in every case of chronic indigestion and dyspepsia, but I do emphatically state that every such case should be cured. Therefore proper medical and hygienic means should be employed and they will bring about a cure if the trouble is a functional one and not dependent on one of the lesions cited above. If our medical treatment has proved a failure than it is our duty to resort to surgery.

OPERATIONS.

In this paper I shall not enter into a technical description of the various operative procedures. I shall simply mention some principles which are to be employed.

As all cases of gall stones have been dependent upon infection, drainage is of the utmost importance and should be a routine procedure. For this reason the gall-bladder should be preserved unless there is very strong reason for its removal. Drainage should be continued until clear bile is flowing. It should not be discontinued while there is mucus present nor while the bile is dark, thick or viscid.

The gall-bladder should be preserved unless there is a distinct reason for its removal. Among such reasons are a permanent closure of the cystic duct with hydrops of the gall-bladder gangrene of the gall bladder, a gall bladder rendered useless by ulceration, a much thickened gall-bladder suspicious of cancer.

Drainage is most important in the treatment

of pancreatitis. Should prolonged drainage be indicated on this or any other account the gall-bladder should be anastomosed with the intestine. Success depends on thorough drainage and on complete operation. One must be sure that there are not stones left behind, therefore all of the ducts must be thoroughly searched and probed. Whenever the common duct has been opened it should be drained and it should be opened and drained when the gall-bladder is removed.

In closing I wish to lay stress on the importance of the study of living pathology. Most of our accurate knowledge of diseases of the alimentary tract has been acquired in the last few years and the most important lessons have been learned at the operating table. There we see conditions as they are and we see them in life. The operating room is a much better place to study these cases than is the dead house. It is not only more convenient and agreeable to the patient but is also much more useful and instructive to the physician. Physicians and surgeons should study these cases together at the operating table. If this course is pursued much enlightenment will follow and a great benefit will thereby accrue to humanity.

CANCER OF THE PROSTATE.*

By EUGENE FULLER, M.D.,

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THE object of this paper is not to treat statistically or exhaustively this important subject, but rather to emphasize certain points, the appreciation of which should aid chiefly in the diagnosis and management of this class of cases. From the standpoint of the genito-urinary specialist, cancer of the prostate is not rare. My general impression, without a tedious study of my hospital and private records, would be that about one in seven or eight of the cases which have come under my observation with symptoms of prostatic obstruction, have been found to have cancer as a cause rather than benign senile hypertrophy. The great majority of individuals so afflicted are elderly, corresponding, as far as age is concerned, exactly with those harboring senile hypertrophy. In a small minority of cases, those so suffering are younger than one would expect to find with senile hypertrophy, as, for instance, around fifty, or in the later forties. Exceptionally, younger, and rarely, very young men may be attacked. In these latter cases the disease is, as one would expect, terribly rapid in its development and fatality.

In the clinical study of this subject it is well to divide these cases into two groups. In the first and principal one, cancer engrafts itself on the part as a primary pathological process. In the second and minor group, what was primarily

apparently benign senile hypertrophy becomes, secondarily, cancerous. In these latter cases the irritating effects of trauma and infection, to which the gland is exposed in a state of hypertrophy, act as agencies favorable to the implantation upon it of malignancy as a secondary pathological process.

In considering the clinical histories of the first group the chief symptoms, just as in connection with benign hypertrophy, relate to the urinary function, which is interfered with by the development of obstruction to the outflow at the vesical neck. An increase in the urine frequency is first noticed, and the patient becomes aware of the fact that his nights are more or less disturbed by his having to get up to urinate. The stream becomes somewhat feeble in force and slow to start, especially if the bladder be at all full. From these initial symptoms, the urinary discomfort increases in the well known manner until overflow or retention ensues. The most striking clinical differential point, in this connection, between cancer and senile hypertrophy is the quickness of development and progression of the urinary symptoms in the cancerous as compared with the latter condition. In senile hypertrophy, one usually gets a history from an observant patient of three years, and often considerably more, from the commencement of the urinary symptoms until the advent of really marked and serious evidences of urinary obstruction. In the cancerous cases, perhaps not more than a month, and usually not more than six months, marks the period in question. With cancer, also, pain is apt to be a more pronounced feature than with benign hypertrophy. Even before the bladder has become infected and before the stoppage to the flow of urine has become pronounced, the complaint is often made that the urinary act is quite painful, while later, after urinary infection has occurred, pain in connection with urination is apt to be a very marked feature. In cases where the neoplasm has progressed beyond the confines of the prostate, so as to involve the pelvic nerve trunks, complaint is made of pains which radiate from the pelvis down one or both thighs, also of deep-seated suprapubic or sacral pains. Associated with these symptoms there is apt to be an undue loss of weight and strength, together, oftentimes, with a considerable degree of cachexia. Although hæmaturia is not an infrequent accompaniment of any form of prostatic obstruction, still it is more usual in connection with cancer; and when bleeding occurs during tenesmus at the end of urination in a case free from vesical infection, the surgeon should always have the existence of this condition in mind in making his diagnosis. In such cases, after vesical infection has occurred, bleeding is, of course, a more prominent feature.

In cases of the second group, where cancer finally grafts itself on an existing condition of

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

senile hypertrophy, the advent of this secondary complication is apt to be associated with an aggravation of the previously existing symptoms, together with the appearance of some of the features already described in connection with the first group of cases. If a patient has been depending on the catheter for relief, the secondary development of cancer is apt to lead to a crisis, in that the catheter may no longer be passable, or its passage may provoke so much pain or hæmorrhage as to make its longer use inadvisable, an operation more or less radical being demanded.

In making a physical examination in these cases, the evidence presented to the digital feel per rectum is of great importance, and many times so definite as to allow a diagnosis of cancer to be made as positively as such a diagnosis can ever be independent of the histological findings. The feel is apt to show the prostate, besides being enlarged, to be also nodular, irregular and unusual in outline, and often hard—generally in areas—and unyielding. Then, as the finger-tip explores what should be the margins of the organ, it will usually be discovered that in whole or in part these margins have been obliterated, the nodular, hardened, hypertrophic areas extending beyond. Such extensions in a lateral direction fill up the space between the gland and the pelvic wall, soldering, as it were, the prostate firmly to the bony structure of the pelvis. The extensions backward fill up wholly or in part the post-prostatic space, so obliterating oftentimes the normal feel that the seminal vesicles cannot be outlined. In such conditions, it may be impossible to reach beyond the nodular area. In cases of this description, the free hand of the examiner should, by being applied suprapubically, aid the hand making the rectal exploration through bimanual palpation. Such palpation, should there be a degree of relaxation of the abdominal walls, may reveal extensions into the sigmoid and the posterior vesical floor which otherwise would have remained beyond the limit of reach.

The final aid to diagnosis lies in urethral and bladder exploration. Urethral exploration, by itself, is generally of little or no aid. Marked rigidity of the prostatic urethra may be noted. Endoscopic examinations show nothing characteristic in the few instances wherein they are possible of accomplishment. The cystoscope may be of much positive aid, especially the instrument with a small calibered shaft of 18 French with a brilliant telescope, and with an objective which allows a view of the vesical neck. Where there has been a neoplastic invasion of the trigonum, nodular excrescences can be seen. Where no such involvement has occurred, the intravesical appearances closely resemble those existing in connection with senile hypertrophy, except in cases where malignant development has been rapid. In such it may be

seen that there is an absence of muscular hypertrophic changes in connection with the bladder, a suspicious circumstance.

The management of these distressing cases is a subject of importance, especially as concerns the main group wherein cancer grafts itself on a prostate as a primary pathological process. In such cases, if a diagnosis could be made very early, while the disease was wholly confined to the prostate proper, prompt prostatectomy with a careful and radical removal of the entire gland would, of course, be the proper and ideal treatment. Such a diagnosis is rarely made in the very early stage of the disease. It is unusual for a genito-urinary surgeon, or perhaps even a physician, to be consulted at that period; and even should a genito-urinary expert be then consulted and make such a diagnosis, the diagnosis could not be given positively, as the evidence then presented could not be conclusive. The patient then would be suffering only slightly and would probably be little inclined to acquiesce in so doleful a diagnosis, especially as it could be given only suggestively; and should he not fully acquiesce in the diagnosis, there is no likelihood that he would promptly submit to prostatectomy. The practical result of the announcement of such a diagnosis in the early stage is that in eight cases out of ten the patient abruptly deserts the competent surgeon and seeks advice in another quarter, where the first findings are probably not confirmed and are very likely ridiculed. In one of the remaining cases, so much time is wasted in trying to get confirmatory opinions that the chance is lost, while in one case prompt operation is accepted.

Where the disease, as is usually the case, has extended beyond the confines of the prostate before it comes under observation, there is no likelihood that any operation could radically free the patient of his trouble. Under such circumstances the question of management presented to the surgeon is very different from that associated with the preceding class. In this latter class the aim of the surgeon should be to prolong the patient's life, at the same time procuring for him the greatest possible comfort. As the result of considerable experience, I am not inclined to operate in this class of cases until the prostatic obstruction to urination has become so marked that the necessity for radical treatment is self-evident to the patient. My reason for so doing is exactly the same as guides the ophthalmic surgeon in dealing with cataract. Such a surgeon aims to delay operating until the symptoms of blindness have developed sufficiently to profoundly impress the patient with the serious reality of his ailment. The result of an operation then performed is thoroughly satisfactory to the patient, in spite of the necessity and inconvenience of wearing strong glasses to correct the loss occasioned by the removal of the lens; whereas, if the operation has been per-

formed before the patient has become markedly conscious of his impending affliction, then the having to wear the glasses just mentioned, together with the loss of visual accommodation, is apt to prove so irksome as to render the patient thoroughly dissatisfied, not only with the result of the operation, but also with himself for having submitted to it, and perhaps with the surgeon for having urged it.

If prostatectomy be performed in a case where the cancerous process has so advanced that the radical and complete removal of the growth is impossible, and at the same time before the patient has become especially inconvenienced by his disease, it is probable that the development of the growth subsequent to operation will after a short interval render the patient as uncomfortable, or perhaps more uncomfortable, than he was before operation. Such being the case, it is easy to picture his state of mind. Whereas, had there been serious and painful symptoms due to retention, perhaps aggravated by hæmorrhage, the relief experienced by the operative removal of the obstruction and the cessation of such symptoms would be thoroughly appreciated, and would serve to enable the patient to bear with equanimity the minor ills and discomforts associated with a non-obstructive progression of the growth.

In cases of the second group, wherein a cancerous growth has secondarily engrafted itself on a previously existing senile hypertrophy, the preceding argument does not hold. In such cases there are generally present marked evidences of urinary obstruction before the advent of the secondary cancerous process. In these cases prostatectomy should be urged and performed as soon as the assent of the patient can be obtained. Where prostatectomy has been thoroughly performed for cancer of the prostate in a case wherein the disease has not extensively progressed beyond the gland, the growth being, as is usual, somewhat schirrous in its composition, the outlook for the patient ought to be a state of complete or comparative comfort, as far as his urinary condition is concerned, for a period of from seven to eleven months. After that time it is unusual for symptoms of retention to recur, but rather those of incontinence, and should there have developed intra-vesical infection, especially associated with triple phosphate deposits, there may be considerable vesical pain, which could then be relieved by anodynes.

When symptoms of grave discomfort gradually develop many months after prostatectomy in these cases, they are generally due to the gradual progress of the disease into other parts away from the immediate region of the prostate. Thus, the pelvic blood vessels may become invaded, phlegmasia dolens resulting. The extension may be under the pubic arch and into the space of Retzius, or the invasion may involve

the sigmoid and, later, the liver. An important direction of invasion, and one perhaps more frequently taken than any other, is into the trigonum and along the vesical floor. The importance of this last direction of the growth lies in the fact that the ureters are after a time involved, the usual result being occlusion of their calibers. When this complication develops sufficiently, there is first a progressive hydronephrosis before occlusion. As the extension usually develops somewhat irregularly, there is apt to be a corresponding difference in the period of ureteral obstruction as regards the two sides. The gradual, or perhaps the quick, development of uræmic symptoms, associated usually with moderate or slight pain in the affected renal region, are the chief diagnostic symptoms indicative of this complication.

I have on five occasions performed a double nephrostomy to counteract this complication and to prolong life. In one of these cases I succeeded in prolonging life for about three months; two, very severely uræmic at the time of operation, died shortly after; while of the two others, one lived about two weeks and one about a month. The one who lived three months never felt grateful to me for prolonging his misery, although from a surgical point of view simply, the result was most satisfactory. When one considers that with this complication associated with uræmia, death is usually as comfortable as probably possible, it almost borders on an act of cruelty for the surgeon to rid the patient through operation of his dreamy, painless state, just to, at best, prolong life very shortly and at the same time to bring him back to a vivid realization of his bodily pains and of his approaching dissolution. In the absence of some special reason, as, for instance, the making of a will or the prolongation of life until someone especially dear arrives, I do not feel that I shall ever again urge this final procedure.

In a paper I am shortly to write I intend dwelling on the technique advisable in operation for the relief of cancer of the prostate.

Discussion.

DR. NATHAN JACOBSON, Syracuse: Cancer of the prostate is a subject which has interested me very much and was the subject of a paper published in the *Annals of Surgery* in 1901. In this paper I reported a case of cancer of the prostate which I had operated in 1898. At that time I reviewed the literature of the subject. I was able to discover only five cases in American literature of cancer of the prostate at that time. Prostatic surgery had not become popular with American surgeons; but since the prostate has been so freely attacked and removed, we have learned that prostatic cancer is by no means as uncommon as it was supposed to be at that time. We have learned also that cancer of the prostate can occur with-

out making itself manifest. Many times we remove the prostate, thinking it to be simply an enlarged or hypertrophied prostate, when the macroscopic appearance would not justify the conclusion. We likewise find cases of carcinoma of the prostate in which the first symptoms are due to the metastases. This was known as long as 20 years ago. It is known that sarcoma of the prostate can attain an enormous size and appear in childhood and in infancy; that sarcoma of the prostate can also occur in advanced age. Only recently I had occasion to review one of the English medical journals in which I found the report of a case of carcinoma of the prostate. The gland was removed in a man 72 years of age. It weighed $2\frac{1}{2}$ lbs. and was of the type of carcinoma that has been described and which fills the entire pelvis. On the other hand, most of our cases of carcinoma of the prostate are of the hard type limited to lobes of the prostate and do not spread beyond it at an early period. It has been held by some of the French surgeons, and I think justly too, that there is no period at which we can discover the presence clinically of carcinoma of the prostate when the disease has not reached beyond the prostate and has not already involved the lymphatics of the pelvis. The question therefore presents itself, is there any time when one can safely predict that the removal of the prostate gland for carcinoma is to be a radical and a completely successful operation. However, when we are fortunate enough to remove the prostate, presumably for hypertrophy, we may find upon microscopic examination it to be malignant. Carcinoma of the prostate occurs, as a rule, after the 50th year; sarcoma at the 35th year. It seems to me we ought to be very guarded in dealing with a hard nodular prostate, that we may anticipate the condition to be malignant and adjust the surgical procedure accordingly. If it is true, as the English surgeons say, that fully 15 per cent. of all cases of prostatic enlargement are carcinomatous, we should be prepared for this condition of things. I know there are some surgeons in this country who have even found a larger percentage of malignancy in the prostates they have removed. It has not been so in my own experience. I have found a smaller percentage, but no man has a right to base his decision upon his personal cases. There are certain manifestations which suggest malignancy in the enlarged and hard prostate, and one of these to which I desire particularly to call is pain. Pain associated with prostatic cancer is different from that dependent upon simple enlargement. Pain associated with simple hypertrophic conditions results from obstruction and is due to pressure. On the other hand, when we have to deal with a malignant condition of the prostate the pain is apt to be constant and follows the course of the sacral or lumbar nerves, and is more apt to be disconnected with urinary distress. Moreover the pain is out of proportion to the changed condition of the prostate, being

very intense. I think that is a very suggestive manifestation, and I have no hesitancy in expressing that fear. We are able to determine by physical examination whether we are dealing with malignancy or not. The irregular, hard areas we get in the ordinary form of carcinoma of the prostate do not yield to the manipulation of the finger. These hard prostatic masses remain firm despite massage and despite any of our manipulations. If, then, we have to deal with a prostate which is enlarged, irregular, nodular, which is associated with pain that is out of proportion to the enlargement and not dependent upon the obstructive disturbances it creates, I think we have occasion to fear that we are dealing with a malignant condition of the prostate gland. When we find a condition so advanced, I think our experience justifies the conclusion that no operation which we can perform will be sufficiently radical to prevent a recurrence of the disease.

As far as the extension and invasion of the prostatic carcinoma is concerned, it is certainly much more apt to spread into and upon the bladder. The seminal vesicles are involved in a large percentage of cases. The trigone of the bladder is involved in some cases, and therefore, if one is to do a radical operation, one must remember the extent of the involvement, and whether the operation suggested will be sufficiently radical to accomplish a permanent cure. My opinion is that when carcinoma has reached this stage it is not operable, and that the best we can do is to secure temporary relief.

As to the manner of relief in the class of cases in which the carcinoma has involved the bladder, I have not found that perineal drainage is of no avail except for a short time. In this class of cases suprapubic drainage in my hands secures relief for a long period. I feel that perhaps as much as we can accomplish for these patients is to secure the relief that we can give them by giving exit to the urine and not attempt anything radical.

DR. JAMES N. VANDERVEER, Albany: I have been particularly impressed with what Dr. Jacobson has said in his discussion concerning pain. In 1908 Dr. Albert Vanderveer, Dr. Edgar Vanderveer and myself worked out from our experiences 67 cases previous to that year in which we found 32 per cent. of our cases were carcinomatous, of which about half you could diagnose clinically, and half were thrown back to us by the pathologist with the microscopic report that carcinoma was present. Since then I have kept track of the cases I have had, and I have had 45 cases since 1908, which gives me 16 per cent. practically of carcinoma, and in all of these cases pain was present, and of such a nature that it radiated down the legs, one or both; in every few did I find the pain radiated up over the suprapubic region in which the disease was far advanced. In the 7 cases of the 45 which were carcinomatous, we have 2 that were

severe in type in regard to the pain, exceedingly severe, so much so that the operation did not relieve them in any wise except to give them drainage of the bladder.

I have tried, so far as possible, to educate the general practitioners about this region, that when they get a bladder condition in which pain is a predominant symptom, not to keep that patient so long and allow him to go on, but get him into the hands of a man who can study his case in an institution, go over it in every way, and make some formal diagnosis. In fact, I have been prone to operate on most cases that have come to me whether the prostate was large or small, but where pain was present, and where there were areas of hardness, and I have rescued about 3 out of 7 cases with very early carcinoma. The fault I believe in most of these cases we see lies in the fact that the general practitioner does not understand the condition early enough. He does not know when these patients are in a condition satisfactory for operation. Cancer of the prostate, as we know, is enclosed in the capsule of the gland for a long time before it breaks through, and when it does break through, it grows with lightning-like rapidity, and the part we have seen involved in the 3 cases I have witnessed at autopsy through the kindness of the pathologist was that the metastasis was first in the liver. I have had 1 case where the man said he believed there was cancer of the liver. There was secondary, and on introducing my finger into the rectum cancer of the prostate primarily was located.

What should be the nature of the operation, is a question perhaps for us who do general surgery, and especially for those who do special prostatic surgery.

Dr. Pilcher was to have presented a paper on perineal prostatectomy. I have a copy of his notes, and in them I cannot find the advantage of the operation between malignant and the non-malignant prostate in reference to the supra-pubic operation. I believe there is no operation other than the perineal route if we have pain and suspect malignant disease, as we cannot get at the disease so readily from above.

In my case I have had two fistulæ, one in a man that has remained for three years, but who is well except for the recto-urethral fistula. This man refuses to have a second operation done, saying that he is perfectly comfortable. I have a man operated on 6 months ago who has a fistula, but it is closing up. Both of these were in cases of carcinoma of the prostate. This fistula is closing up quite readily, and a slight operation will give him perfect urethral patency. Dr. Albert Vander Veer, my father, has a case walking around town, a detective, who was operated on 6 years ago, a portion of his rectum was taken out, and an attempt made to sew it over at the time of the operation, but the stitches gave way on account of infection. He is perfectly well. He had a carcinoma of the prostate

which involved the capsule yet had not broken through. Some people are prone to say, do not operate in every prostatic case. I believe if the bladder is able to empty itself; if the mechanical condition can be brought about the same as it was before operation or approximately so, it is not for us to take chances with such a case until it goes on to malignancy, because when the case goes on to malignancy, then it is good-bye to the patient as a general thing. We should operate, and should operate just as early as possible in prostatic cases in order to offset that percentage of beginning carcinoma and to make our patients well. There is not a surgeon who would hesitate to put his finger on the abdomen of a patient and say, "this looks like an early appendicitis," and there is no surgeon who would not advise immediate operation after making this diagnosis, and why should we not swing to that idea in prostatic conditions?

DR. ALBERT VANDERVEER, Albany: A paper like Dr. Fuller's and the timely discussion we have listened to since makes a great impression upon a man at my time of life, particularly when I think of how we were compelled to treat these cases 30 or 40 years ago. The advance made in prostatic work is paralleled with any work in surgery of the past 20 years, and particularly in the non-malignant cases of enlarged prostate. The results are much better than those obtained in former times. The general practitioner is becoming far more willing to have these operations done. He is showing more confidence in regard to the removal of the prostate, and particularly if the disease is not malignant in character. I think we can go a little further. I think we can say to them, although we are suspicious that the case may be one of carcinoma, yet I believe we are justified in emphasizing the necessity of immediate operation.

In the 67 cases that have been referred to by Dr. James Vanderveer, and the number now more nearly approaches 100, we have found the same relative percentage of carcinoma, yet in which we have succeeded in removing the gland thoroughly well, and the return is not so serious. In the case of Dr. Jas. Vanderveer referred to of the man seen walking about our streets, I will say that he is comfortable and looks well. That is a well established case. I might speak of others where they have lived longer than 11 or 18 months, where they had this condition.

Dr. Jacobson referred to one class of cases, which was also referred to by Dr. Fuller, and that is the non-operative cases of malignancy. These are the sad cases. These are the cases that I have seen in consultation, and have had a few of them under observation for the past five years. What can we do to relieve them? I am satisfied that perineal drainage is not appropriate for those cases. It does not give them the relief from drainage they are entitled to. No method will relieve them of the suffering. The pain they have in connection with an ad-

vanced case of malignancy of the prostate is most distressing and the least amenable to treatment. If we can advance in that direction, it would be a God send. I have sometimes thought, in looking at such a patient, if we could transplant the ureter into the rectum, into the large intestine in some way, and get rid of the entire function of the prostate or bladder, we might afford these patients more relief.

I believe suprapubic drainage is a better method of treatment. Just such papers as this, just such discussions as these, will advance us to a higher plane, where we can relieve patients and inspire more confidence, and get at the cases early, and I must say, I shall not give up the hope that we can yet do a great deal for these patients with carcinoma of the prostate if early operation is performed.

DR. EUGENE FULLER: New York City (closing the discussion): I do not know that a great many debatable questions have been raised in this discussion, but there is one point that I desire to refer to, namely, the pathologic findings in cancer of the prostate. There is no branch where we need a more careful pathologist than in carcinoma of the prostate. He must know the conditions which are considered clinically, which have been pronounced carcinomatous, and vice versa. Cases which we consider clinically and positively malignant have been pronounced benign. The trouble is, the structure of the prostate being glandular, it is an easy thing for a pathologist to call the condition adeno-carcinoma in a case where the structure of the gland is such that it requires much experience in pathology to be able to differentiate these cases. That is one thing you want to consider. I know of two cases which I saw some time ago that I thought were positively malignant, and yet I was surprised to receive a report that they were benign, and they proved to be malignant. The pathologist needs to give a great deal of attention to these cases and to the slides before making a report. He should examine several slides.

There is no doubt about the importance of early operation, especially in those cases where the trouble is secondarily engrafted on what seems to have been a benign hypertrophy of the prostate, which very likely it is not. It may have been malignant and inside the capsule, as Dr. Vanderveer spoke of, and then when it bursts through, it grows with great rapidity. We operate on these cases as quickly as we can. The insidious case that begins in a younger man is malignant, and the first symptoms are those of malignancy. The growth is so rapid in some of these cases sometimes that it is not well to rush in and do a quick operation, because these are the ones in which the disease comes on so insidiously and without previous symptoms of prostatic obstruction. These are the ones that give us the most trouble.

As to the question of pain, as I brought out in my paper, it is a great aid in making the

diagnosis in connection with conditions of the prostate. It is a very important symptom, as we all know; at the same time, it is not well to always think that because a man has much pain the prostate is necessarily cancerous. There is no pain greater than that which occurs in tubercular conditions associated with prostatic hypertrophy. I recall one case in which I removed prostatic calculi, affording the patient relief, and the case did not prove malignant, as I suspected it would.

There is another condition which we get every now and then, namely, a calculus encysted in the post-prostatic pouch, which causes great pain.

THE PUBLIC HOSPITALS OF NEW YORK STATE.*

By ROBERT W. HEBBERD,

Secretary of the State Board of Charities.

THE subject upon which I have been asked to address you this afternoon, "The Public Hospitals of New York State," is a very comprehensive one and can be treated in the most general way only within the brief amount of time that has been allotted to its consideration.

That there are a few good public hospitals in this state, such as the new Bellevue, Harlem, Fordham, and the new Coney Island Hospitals, all in the City of New York, can hardly be denied, and is a cause for congratulation. It would be a pleasing task to devote all of my time today to a study of their excellencies if any real good were likely to be accomplished thereby. Most of the time can be better spent, however, it seems to me, in seeking to point out the defects of our public hospital system in order that such defects may be better understood and corrected, whereby in time, perhaps, through the influence of public opinion, all of our public hospitals may become excellent in point of size and efficiency, and thereby better perform the beneficent purpose for which our public hospital system has been created.

The State Charities Law and the Poor Law both recognize the importance of this method of procedure, inasmuch as they require the State Board of Charities to bring to the attention of managers of the hospitals and other institutions, not their excellencies, but their defects, in order that they may be corrected and reformed.

At the very gateway to the port of New York, one finds in the lower bay, under State control, two hospital islands intended for the detention and care of immigrants, who might otherwise introduce dangerous infectious diseases into this country. A visit paid to Hoffman's Island over a year ago convinced me of the crudeness and inadequacy of the quarantine provisions there, and I urged the then health officer of the port to make such provisions adequate and effective. So far as I can learn, however, nothing of importance has been accomplished in this direction.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

The present health officer has asked to be granted large means for this purpose, and the legislature has to some extent acceded to his request. Without attempting any discussion as to whether or not such hospitals should be under state or national control, it seems obvious that greatly enlarged and better hospital provision should promptly be made at our port of entry if the quarantine is to be at once humane and effective.

At the other end of the state we find the great and flourishing city of Buffalo, some of whose far-sighted and enterprising citizens in public office, as well as in the private ranks of life, have long been striving to secure the establishment of a general public hospital in that city, to take the place of the confessedly inadequate and unsuitable public hospital now conducted in connection with the Erie County almshouse located in the outskirts of the city. These efforts, while at one time promising, now seem, for the present at least, to have come to naught. Buffalo has passed the rival manufacturing city of Cincinnati in point of population, but is far behind it in its public hospital facilities, for Cincinnati has appropriated the moneys necessary, through a bond issue approved by the people, to construct a new public hospital which is to cost over two and a half millions of dollars. The work is now largely completed.

In Greater New York much progress has been made in recent years, but the public hospital facilities of that city are almost a quarter of a century behind the times. Metropolitan London, with a population of over seven millions, has 17,000 beds in the general public infirmaries of its poor law unions, and Paris, with a population of nearly three millions, has over 15,000 beds in its general public hospitals, while Greater New York, with its population of almost five millions, has less than 5,000 beds in such hospitals. And neither London nor Paris, nor any other city of the globe, has the terrible congestion of population that afflicts New York City, as we are told by such experts as Lawrence Veiller and E. R. L. Gould. Nor have they the volume of immigration that steadily seeks New York City as a port of entry and in considerable part stays there, to add to the volume of its wealth and increase its burden of poverty. The *Monthly Bulletin* of the Department of Health of New York City for February, 1912, contains this statement: "In London, at the present time, the number of beds available for the treatment of contagious diseases is about 6,500, in addition to which there are some 3,000 beds in reserve for the care of small-pox. Excluding the latter, this is about one bed for every 1,000 of population. In New York, at the present time, we have only about 1,400 beds available for the treatment of contagious diseases, which in proportion to population, is less than one-third of London's quota." The same *Bulletin* contains the following statement with relation to the scarlet fever pavilion at the Willard Parker Hospital: "The present scarlet

fever pavilion, which was erected about eight years ago, was originally intended for not to exceed 300 patients. Within a few months after it was opened it had 500 patients and almost every winter since that time the hospital has been greatly overcrowded." A former commissioner of the department told me personally that at times there had been six children to one bed there.

Under these circumstances it is easy to understand that disgraceful conditions of overcrowding exist during a large part of the year in most of the public hospitals of New York City, depriving patients of the necessary air space and rendering their proper care and treatment absolutely impossible.

Below Canal Street in New York City, with its daily population of probably more than a million and a half of souls, there exists neither public hospital nor public relief station, although at any time a casualty of the most serious nature might occur there. A large part of the territory below Chambers Street on the east side is covered by the horse ambulance and the crude and meagre hospital facilities of the "Volunteers of America." Boston, on the other hand, has a finely constructed and well equipped hospital relief station at Haymarket Square, in the business section of the city, and another in East Boston. Taking the ratio of population and other factors into consideration, New York should have not only an up-to-date relief station in the business section of the city, but should have ten or a dozen others located where the need is greatest. At Blackwell's and Randall's Islands in Manhattan, and at Flatbush in Brooklyn, New York City owns some of the finest hospital properties in the world. In recent years plans have been made for the development of these properties along careful and progressive lines, so that with the necessary expenditure of means, they can easily become the greatest public hospital institutions of their kind in the world. The grounds are there, the plans are ready, and the construction of additional buildings in accordance with such plans is all that is necessary to provide the general public hospital facilities which the city requires.

With over 25,000 new cases of tuberculosis a year, New York City has in its public hospitals, with much overcrowding, less than 1,600 beds for the treatment of the victims of this disease. With the completion of the Sea View Hospital on Staten Island, in the course of the next year probably, 1,000 additional beds will be added to the public facilities for the care of patients suffering from tuberculosis in the city of New York. In point of construction, from the view both of facility and economy of management, this institution will be equal to anything in this country or abroad. This is said without any consciousness of egotism, because the general plans were adopted before my day in the Charities Department in New York City, although I have since done all I could to hasten their completion.

When finished, the per capita cost per bed will be less than that of any other complete public hospital in the city, and but little more than one-half of that of the new Bellevue, while the daily cost of caring for the patients will probably be no more than 60 per cent. of the cost of their care in city sanatoria constructed on the scattered shack and tent policy, which is not only an unsuitable method, but is the most expensive way of caring for large numbers of the really sick. Under high class management this new hospital should render for many years, substantially without repairs, the most effective and beneficent service possible to accomplish for the poor suffering from tuberculosis in the city of New York.

Turning to the question of facilities for the treatment of venereal disease, Berlin has, I am told, in its public hospitals, 500 beds for the care of patients suffering from such disease, while New York City has in its public hospitals but a little more than half that number.

New York City labors under the great and obvious disadvantage of having its public hospitals managed by three different departments of the city government, with almost constant friction, and without much co-operation between them. This lack of co-ordination is probably largely responsible for the growth of hospital facilities in spots only—at Bellevue, for example, where about \$12,000,000 will have been expended for the construction of a hospital for 2,000 patients, while the general public hospitals on Blackwell's Island, Manhattan, and in the other boroughs of the city have been for years deprived of the means necessary for their reasonable enlargement. The remedy is to place the management of all the public hospitals of the city in the hands of a non-partisan board, in the composition of which every borough shall be represented, which will not see one or two institutions only, but the whole field, and will try to have it covered in a just and equitable manner, in accordance with the requirements of the population and the best interests of the city.

The present and the previous administration of the city government have dealt more liberally than their predecessors for many years in an attempt to meet the needs of the situation, but much larger means and a greater co-ordination of effort are necessary to insure success.

In an attempt to meet the needs of the situation the city has made large use of the private hospitals, but this has, in a good many instances, resulted in their overcrowding also, to remedy which the State Board of Charities has been obliged to adopt rules regulating air space requirements.

Outside the City of New York, in this state, there are few public hospitals of consequence. The largest are those connected with the almshouses of Erie, Monroe, Onondaga and Oneida counties. Five small public hospitals, not under

almshouse management, with a total capacity of but a little over a hundred patients, are to be found, at Binghamton, Utica, Oneida, Fulton and Lockport. They treated about 2,000 patients last year. All of these small municipal hospitals are under state supervision, and are reasonably well managed.

A few tuberculosis hospitals have been established by some of the counties and the cities of the state, partly through the movement entitled "No uncared for tuberculosis in New York by 1915." These are located in the cities of Binghamton, Elmira and Poughkeepsie, and in the counties of Ulster, Schenectady, Rensselaer, Ontario and Monroe, and have a total capacity of something less than 300. The construction of a few others is in progress. When it is considered that, outside of New York City, there are in New York State approximately 25,000 new cases of tuberculosis annually, it will be seen how inadequate these institutions are as compared with the needs of the situation.

Inasmuch as there are many counties and cities in the state that will never be likely to construct tuberculosis hospitals of their own, the State Board of Charities, in its report to the legislature of the present year, was led to recommend that the state itself establish district hospitals for this purpose, following the good example set at Raybrook.

The state hospitals for the care of the insane are now, and have long been, overcrowded. This seems in considerable part due to the fact that many insane aliens are permitted to enter the port of New York who necessarily receive treatment at the state hospitals upon the recurrence of the malady from which they suffer. But even should this flood be stopped by better facilities at the ports of entry as proposed, large means will be necessary to increase the facilities of these hospitals, if they are to be made equal to the demands made upon them.

No matter how perfect and adequate the plant, the best results are impossible if the hospital employees are not of good character and ability, or have reason to be dissatisfied with their compensation and maintenance. Aside from the regular nurses, as a rule, the lower grades of help coming into contact with the patients at the public hospitals are not sufficiently paid to enable the institutions to secure suitable employees. A notable example of this evil is to be found in the hospital helper class of the Department of Public Charities in New York City, where between seven thousand and eight thousand changes have to be made annually, to keep a little over a thousand places filled. This is particularly true at Randall's Island, where sick and mentally enfeebled children are cared for in large numbers, and where, strange to say, the pay is lowest. There has been much undeserved criticism of the institutions on this island, but little effort has been made by the critics toward securing a better paid class of helpers at such institutions.

Through the eventual transfer of all feeble-minded and epileptic children now at this Randall's Island Hospital to the new state institution for these classes, known as "Letchworth Village," which is located at Thiells, in Rockland County, this institution should become one of the greatest and best located children's hospitals in the entire world.

An aroused public opinion, particularly in medical circles, is necessary to secure improvement in the public hospital facilities in the State of New York, and until this has been effected there can be but small hope for a satisfactory outcome of the efforts being made in this direction.

NOTICE.

At a regular meeting of the Physicians' League, the attendance of which was very representative of the whole of Brooklyn's medical profession, held at the County Medical Society Building, September 27, 1912, besides the regular business of the League, a very interesting and animated discussion as to the abuse of medical charity occupied the evening.

The discussion was quite generally partaken in by those present, and being more or less extemporaneous, was very varied in its trend, so that a motion was made by Dr. Bartley and unanimously carried that the chairman be required to appoint a committee to tabulate the more conspicuous abuses of medical charity and the most promising of the suggested remedies therefor, so that these can be acted upon serially at the next meeting, which will take place October 18, 1912, at the County Medical Society Building and which promises well to develop some valuable progress in this direction.

It goes without saying that the co-operation of all medical men will be sincerely welcomed.

The American Surgical Association has appointed a Committee consisting of Drs. William L. Estes, South Bethlehem, Pa.; Thomas W. Huntington, San Francisco, Cal.; John B. Walker, New York City; Edward Martin, Philadelphia, and John B. Roberts, Chairman, 313 S. 17th Street, Philadelphia, to report on the Operative and Non-operative of Closed and Open Fractures of the Long Bones and the value of radiography in the study of these injuries. Surgeons, who have published papers relating to the subject within the last ten years, will confer a favor by sending two reprints to the Chairman of the Committee. If no reprints are available, the titles and places of their publication are desired.

JOHN B. ROBERTS,
Chairman,
313 S. 17th Street, Philadelphia.

A MEDICAL STUDY OF THE ALCHOLIC PROBLEM.

In 1870 a number of very prominent physicians and medical experts formed an organization in New York City, called the American Society for the Study of Alcohol and Other Narcotics.

This was the first medical association in the world to take up the scientific study of alcohol and inebriety, and determine from experience, laboratory studies and groupings of facts, the phenomena and disease of the spirit and drug neuroses.

The special purpose was to examine this subject above all theories and conclusions, particularly along its etiological, physiological, therapeutic and medicolegal relations; also to compile and make available such

studies for home, office and institutional treatment, and point out the remedies and prophylactic measures for restoration and cure.

The 42d annual meeting of this society will be held in Washington, D. C., December 19th and 11th, 1912. A large programme of scientific papers by medical men, many of them distinguished foreigners, will be presented.

This meeting and the subjects discussed will attract a great deal of attention, not only among medical men, but also among laymen, who have intense personal interest in the great questions of alcohol and drug taking.

Programmes and further information can be had by addressing,

Dr. T. D. CROTHERS, Sec'y.,
Hartford, Conn.

Medical Society of the State of New York

PRIZE FUNDS.

All essays for the prize funds must be in the hands of the Chairman of the Committee, Dr. Albert Vander Veer, 28 Eagle Street, Albany, N. Y., on or before February 1, 1913. The Lucien Howe Prize Fund is open to all members of the profession; the Merritt H. Cash Prize Fund only to members of the Medical Society of the State of New York.

COMMITTEE ON REVISION OF BY-LAWS.

The Committee appointed by the House of Delegates at its last meeting consisting of Drs. Egbert Le Fevre, Wendell C. Phillips and Wisner R. Townsend, of New York, Wesley T. Mulligan, of Rochester, and Albert Vander Veer, of Albany, have held a meeting and organized.

The Committee would deem it a favor, if any member has any suggestion to make as to changes in the Constitution and By-Laws, if he will submit the same to the Chairman at 17 West 43d Street, New York, on or before December 1, 1912.

EGBERT LE FEVRE, *Chairman.*

Correspondence

To the Editor of the NEW YORK JOURNAL OF MEDICINE:

Sir: "The Hospital Plan," in the October issue is admirable, and I wish to indorse its forcible and common sense viewpoint.

The battle is now more than ever for men like you in the editor's chair, of influential medical journals, to guide people aright. It would seem as if those who tell the truth in a broad minded way were to be snowed under more and more by the "progressives" in so-called science, who ignore in reality, that we are all in a world where the general weal should stand foremost, and not the desire of the too ambitious, personal seekers of much fame and more fortune.

Where would be our hope and trust, when a limited few of the older generation now rapidly passing away, are not listened to and followed before their voices for right thinking and doing are no longer heard?

Alas, the pity of it.

BEVERLEY ROBINSON, M.D.
New York, October 23, 1912.

District Branches

FIRST DISTRICT BRANCH.

ANNUAL MEETING AT POUGHKEEPSIE, OCTOBER 4, 1912.
BUSINESS SESSION.

The meeting was called to order in the Vassar Bros. Institute by the president, Dr. D. B. Hardenbergh. The minutes of the last meeting were read and approved as read.

On motion, the president appointed as nominating committee for the officers for the coming year C. E. Townsend, J. E. Sadlier and G. S. Mooney.

The following amendment to the by-laws, proposed at the meeting of 1911, was read and adopted unanimously: "Amend Section 3, Chapter II, by striking out the words, 'on January 1st of,' and substituting the words, 'at the close of the annual meeting of the Medical Society of the State of New York.'"

Dr. Callan asked for a reading of the by-laws as amended: Sec. 3.—"The officers elected shall assume office at the close of the annual meeting of the Medical Society of the State of New York each year, and serve for the ensuing year or until their successors are elected."

The Committee on Nominations reported the following nominations for the ensuing year: President, John C. Otis, Poughkeepsie; Vice-President, Henry L. Winter, Cornwall; Secretary, Charles E. Denison, 143 W. 76th St., New York City; Treasurer, Nathan A. Warren, Yonkers. On motion of Dr. Callan, the secretary was instructed to cast an affirmative vote.

The following papers were read:

President's Address, Daniel Bailey Hardenbergh, M.D., Middletown.

"The Owen Bill," Hon. Richard E. Connell, House of Representatives, Washington, D. C.

"Functional Nervous Diseases Due to Eye Strain," Peter A. Callan, M.D., New York.

"Progressive Curvature of the Radius (Madelung's Deformity)," Henry Ling Taylor, M.D., New York.

After a recess taken to allow the members to enjoy the luncheon served at the Morgan House, the meeting was again called to order, and Dr. A. Jacobi, president of the American Medical Association, was asked by the president to address the meeting.

The president called Dr. John C. Otis, the elected president for the ensuing year, to the chair. After thanking the members for the honor, he retired.

"Pyloric Stenosis in Infancy," Charles Gilmore Kerley, M.D., New York.

"A Consideration of Diet in Acute Diseases," W. Stanton Gleason, M.D., Newburgh.

"Urgent Surgery in Association with Uterine Fibroids," James E. Sadlier, M.D., Poughkeepsie.

"Gall Stones," Parker Syms, M.D., New York.

"The Present Status of Medical Therapeutics," Andrew Victor Jova, M.D., Newburgh.

"The Relation of Prolonged Pregnancies to Some Cerebral Lesions and to Backward Mental States," Henry Lyle Winter, M.D., Cornwall.

"The Old Method of Treatment of Syphilis, Versus the New," Mihran B. Parounagian, M.D., New York.

After the reading of the papers a circular letter was read from Dr. H. L. K. Shaw, chairman of the section on pediatrics of the State Society.

SECOND DISTRICT BRANCH.

ANNUAL MEETING AT MINEOLA, OCTOBER 2, 1912.

The sixth annual meeting of this branch assumed the form of a dinner which was tendered by the Queens-Nassau Medical Society. Dr. H. M. Warner, president of the society, acted as toastmaster.

Dr. Walter B. Chase, president of the district branch, presented his presidential address.

Dr. Abraham Jacobi, president of the American Medical Association, gave an address on the difficulties of medical practice in the city, treating the subject facetiously yet seriously. He drew special attention to the

necessity and importance of the general practitioner in comparison with the specialist and laboratory men. He made a strong plea for physicians to meet for criticism and stimulation. The possibility of the medical organizations, especially the American Medical Association, as a power in the country was sharply brought out.

A telegram was read from Dr. J. F. W. Whitbeck, president of the Medical Society of the State of New York, regretting his inability to be present.

Dr. W. F. Campbell, vice-president of the Medical Society of the State of New York, spoke on the economic problems before the medical profession as a question for the National and State Societies.

Dr. Wisner R. Townsend, secretary of the State Society, spoke in a tone to stimulate increased activity in the district branch meetings, and brought out the advisability of strengthening present representative bodies rather than forming new ones.

Dr. E. H. Bartley, president of the Medical Society of the County of Kings, replied to Dr. Jacobi in defense of the laboratory men.

Short addresses were also made by Dr. J. S. Cooley, secretary of the Queens-Nassau Society; Dr. H. Halsey, president of the Suffolk County Society, and Dr. Frank Overton, secretary of the Suffolk County Society.

A nominating committee, composed of Drs. Frank Overton, E. H. Bartley and F. T. De Lano, was appointed and reported as follows: For President, Victor A. Robertson, Brooklyn; Vice-President, James S. Cooley, Mineola; Secretary-Treasurer, Charles Eastmond, 67 Hanson Place, Brooklyn. On motion, duly seconded, they were declared elected.

The reading of the minutes of the last meeting was dispensed with owing to lack of time.

The following amendments to the by-laws, proposed at the meeting held at Brooklyn, October 26, 1911, was adopted: "Amend Section 3, Chapter II, by striking out the words, 'on January 1st of,' and substituting the words, 'at the close of the annual meeting of the Medical Society of the State of New York.'"

SCIENTIFIC SESSION.

"Puerperal Eclampsia," H. A. Wade, M.D., Brooklyn.

Discussion by Drs. V. A. Robertson and E. E. Cornwall, Brooklyn.

"The Stomach as an Organ of Digestion," H. M. Warner, Hempstead.

A vote of thanks was extended to the Queens-Nassau Society for its entertainment.

FOURTH DISTRICT BRANCH.

ANNUAL MEETING AT GLENS FALLS, OCTOBER 8, 1912.

BUSINESS SESSION.

The following officers were elected for the ensuing year: President, Silas J. Banker, Fort Edward; Vice-President, George Lenz, Gloversville; Secretary, Frederick J. Resseguie, Saratoga Springs; Treasurer, George H. Oliver, Malone.

The following amendment to the by-laws, which was proposed at the meeting held in Ogdensburg, October 10, 1911, was adopted: "Amend Section 3, Chapter II, by striking out the words, 'on January 1st of,' and substituting the words, 'at the close of the annual meeting of the Medical Society of the State of New York.'"

SCIENTIFIC SESSION.

President's Address, Fred Gershom Fielding, M.D., Glens Falls.

Address, "Tuberculosis in Pregnancy," Abraham Jacobi, M.D., president American Medical Association, New York.

Address, Heinrich Stern, M.D., New York.

"Surgical Treatment of Goitre," James P. Marsh, M.D., Troy.

"Aphasia," John M. Griffin, M.D., Warrensburgh.

"Differential Diagnosis of Pulmonary Tuberculosis," Henry S. Goodall, M.D., Lake Kushaqua.

"Importance of Pulmonary Rest in the Treatment of Pulmonary Tuberculosis," Lawrason Brown, M.D., Saranac Lake.

"Epileptic Equivalents Influenced by Nose and Throat Work," Walter S. Daly, M.D., Ogdensburg.

"Accidents of Hernia Operations," Dudley R. Kathan, M.D., Schenectady.

"Some Observations on Pancreatic Surgery," Charles G. McMullen, M.D., Schenectady.

"Tumor of the Hypophysis Cerebri, with report of a case and autopsy," L. H. Finch, M.D., Amsterdam.

"Present Status of Diabetes and its Treatment," Roy Munro Collie, M.D., Schenectady.

"Use and Abuse of Nitroglycerine," William Leslie Munson, M.D., Granville.

"Neglect of Laboratory Aids to Diagnosis," David Wilson, M.D., Amsterdam.

"The Physician and the Laboratory," Warren B. Stone, M.D., Schenectady.

"Ileus," George Foster Comstock, M.D., Saratoga Springs.

"Macular Inflammation," John J. O'Brien, M.D., Schenectady.

FIFTH DISTRICT BRANCH.

ANNUAL MEETING AT OSWEGO, OCTOBER 3, 1912.

BUSINESS SESSION.

The meeting was called to order by the president, Dr. J. R. Stockwell. There were about 125 members present.

The following officers were elected for the ensuing year: President, Otto Pfaff, Oneida; Vice-President, Homer P. Marsh, Fulton; Secretary, Frederick H. Flaherty, Syracuse; Treasurer, John A. Barnette, Watertown.

SCIENTIFIC SESSION.

President's Address, James K. Stockwell, M.D., Oswego.

"Nasal Obstructions and the Value of Submucous Resection for its Relief," James Francis McCaw, M.D., Watertown.

"Perforated Duodenal Ulcer, Diagnosis and Treatment," Nathan Jacobson, M.D., Syracuse.

"The Saccharomyces," Walter H. Kidder, M.D., Oswego.

"Increasing the Factors of Safety in Surgical Operations," Jonathan M. Wainwright, M.D., Scranton, Pa.

"Abnormal Temperatures," Martin Cavana, M.D., Sylvan Beach.

"Ether Anæsthesia," Clifford R. Hervey, M.D., Oswego.

Discussion by Edward P. Bailey, M.D., Oneida, and John J. Buettner, M.D., Syracuse.

"Some Lesions of the Lumbar and Sacral Spines," Charles Hume Baldwin, M.D., Utica.

Discussion opened by Clarence E. Coon, M.D., Syracuse.

"Renal Hematuria," read by title, Henry L. Elsner, M.D., Syracuse.

"Blood Pressure," Augustus B. Santry, M.D., Little Falls.

"Lessons from a Case of Tonsil and Adenoid Operation," Thomas Henry Farrell, M.D., Utica.

"Poliomyelitis:—Epidemic at Red Creek, N. Y., 1909-10," Charles G. Plumb, M.D., Red Creek.

"Acute Perforating Gastric and Duodenal Ulcers," Gilbert David Gregor, M.D., Watertown.

"The Possible Effect of Infected Streams on Milk Supply," Fred. L. Meader, M.D., Syracuse.

Discussion by David M. Totman, M.D.

"Immuno-therapy in Ophthalmology and Oto-laryngology," R. L. Crockett, M.D., Oneida.

"The Physician's Relation to the Public Health Authorities," read by title, Charles E. Low, M.D., Pulaski.

"Blood Platelets," James W. W. Dimon, M.D., Utica.

"Pathology and Treatment of Chronic Urethritis in the Male," Joseph Day Olin, M.D., Watertown.

"Landry's Paralysis, with report of a case," read by title, Hyzer William Jones, M.D., Utica.

SIXTH DISTRICT BRANCH.

ANNUAL MEETING AT BINGHAMTON, OCTOBER 15, 1912.

The president, Dr. Frederick M. Miller, opened the meeting in the Monday Afternoon Club. One hundred and forty-nine physicians registered, to which number should be added some fifty or sixty late arrivals who attended the afternoon session, making the meeting the best that was ever held by the Sixth District Branch. The weather was perfect. The members were the guests of the Broome County Medical Society.

After a short address by the president, Dr. Miller, the meeting was formally opened by a paper on "An Analysis of Shock," by Arthur S. Chittenden, M.D., of Binghamton, which was read and afterwards discussed by Stuart B. Blakely, M.D., Binghamton. Also discussed by A. E. Roussel, M. D., Philadelphia; J. C. Fisher, M.D., Elmira, and M. B. Tinker, M.D., Ithaca. "Cancer of the Breast" was presented in detail by Michael M. Lucid, M.D., Cortland. Discussed by Martin B. Tinker, M.D., Ithaca; S. J. Sornberger, M. D., Cortland, and A. E. Roussel, M.D., Philadelphia.

The morning session then adjourned to enjoy an elaborate lunch which was served at the Hotel Arlington. There were about one hundred and seventy-five guests present, many of whom were ladies.

At the business meeting seven out of nine counties in the district were represented at the meeting of the delegates. The following officers were elected for the coming year: President, Luzerne Colville, Ithaca; Vice-President, Thomas F. Manley, Norwich; Secretary-Treasurer, R. Paul Higgins, Cortland. It was voted to hold the next meeting at Ithaca in 1913, the society to be the guests of the Tompkins County Medical Society.

The following amendments to the by-laws, proposed at the meeting held in Elmira, October 17, 1911, were adopted:

Amend Section 3, Chapter II, by striking out the words "on January 1st of," and substituting the words "at the close of the annual meeting of the Medical Society of the State of New York."

The afternoon session was opened by a paper on "Control of Venereal Diseases," Paul B. Brooks, M.D., Norwich, which was warmly discussed, and warmly disapproved in part by R. P. Bush, M.D., Horsehead, and H. B. Besemer, M.D., Ithaca. "Demonstration of Braces and Their Simple Construction Forms," John Joseph Nutt, M.D., New York City. Discussion by Frederick A. Goodwin, M.D., Binghamton, who illustrated it with a little anterior poliomyelitis patient, and by P. M. Neary, M.D., Cortland.

An erudite and extended paper then followed on "Examination of the Insane," Theodore Irving Townsend, M.D., State Hospital, Binghamton, with replete discussion by Charles Gray Wagner, M.D., Supt. State Hospital, Binghamton.

Dr. Wisner R. Townsend of New York spoke for the State Society and urged a full attendance at Rochester in April. He bespoke the special interest in meetings of the district branches and complimented the sixth district and its president for its program, attendance and enthusiasm.

A unique paper, which was enjoyed by all, was read on "Why the Infant Cries," by Howard Burhans Besemer, M.D., Ithaca. Discussed by Luzerne Coville, M.D., Ithaca.

"Some Facts Pertaining to the Ocular Circulation," read by title, Sherman Voorhees, M.D., Elmira.

"A Plea for Early Diagnosis in Surgical Affections," with illustrations was ably presented by Alvah H. Traver, M.D., Albany. Discussed by Frank Walker Sears, M.D., Binghamton, and others.

A most admirable paper on "Acute Phlegmonous Cholecystitis" was presented by Albert E. Roussel, M.D., Philadelphia, Pa. The discussion which followed by George Henry Fox, M.D., Binghamton, and others aroused much discussion and many questions.

The paper on Tuberculosis lymph glands, which was

to have been read by Martin B. Tinker, M.D., Ithaca, was omitted, but its discussion was taken up by Michael M. Lucid, M.D., F. DeW. Reese, M.D., R. P. Higgins, M.D., of Cortland, and A. E. Roussel, M.D., Philadelphia.

The session closed with a vote of thanks to our hosts, the Broome County Medical Society. During the afternoon the ladies who were the guests of the meeting were entertained by the Binghamton ladies by an automobile ride around the city and at four o'clock the parlors of the Monday Afternoon Club were the scene of a pretty afternoon reception and tea, at which Mesdames Miller, Farnham, Chapman, Ross, Tiffany and Fox were among those presiding.

EIGHTH DISTRICT BRANCH.

ANNUAL MEETING AT BUFFALO, SEPTEMBER 24-25, 1912.

TUESDAY, SEPTEMBER 24TH.

The meeting was called to order by the president, Dr. Henry A. Eastman. The minutes of the last meeting were read and approved as read.

The following amendments to the by-laws, which were proposed at the meeting held at Dunkirk, September 26, 1911, were adopted: "Amend Section 3, Chapter II, by striking out the words, 'on January 1st of,' and substituting the words, 'at the close of the annual meeting of the Medical Society of the State of New York,'"

The election of officers, which took place after the papers were read, resulted as follows: President, Arthur G. Bennett, Buffalo; First Vice-President, Carl Leo-Wolf, Niagara Falls; Second Vice-President, Albert T. Lytle, Buffalo; Secretary, Carl Tompkins, Buffalo; Treasurer, Charles A. Wall, Buffalo.

A motion was made that the time and place of the next meeting be delegated to the executive committee, with the suggestion that arrangements be made to meet with the Seventh District Branch at Sonyea. Amended that the society favors a one-day meeting. Amendment withdrawn. Motion carried.

SCIENTIFIC SESSION.

President's Address, "The Duty of the Doctor in Education," H. A. Eastman, M.D., Jamestown.

Remarks on Some of the Needs of the State Society, J. F. W. Whitbeck, M.D., President, Medical Society of the State of New York.

Moved by Dr. T. H. McKee that a vote of thanks be extended to Drs. Whitbeck and Eastman and that their speeches be commended.

"Plaster of Paris as a Surgical Dressing," H. F. Gillette, M.D., Cuba.

Discussion by Drs. C. A. Wall, W. A. Scott, R. O. Meisenbach and C. H. Richards.

"Early Diagnosis of Cancer of the Intestines," F. H. Nichols, M.D., Jamestown.

Discussion by Dr. T. H. McKee.

A dinner was held at the University Club at 7 o'clock, which was attended by about sixty members, who afterwards attended a reception given them by Dr. Lucien Howe at his home.

WEDNESDAY, SEPTEMBER 25TH.

"Ambulatory Clinic," Grover W. Wende, M.D., Buffalo.

Case 1. Dermatitis Herpetiform.

Case 2. Urticaria Pigmentosa.

Case 3. Pellagra.

"Pancreatic Cyst," H. A. Smith, M.D., Buffalo.

"Syringomyelia," E. A. Sharp, M.D., Buffalo.

"Residual Paralysis of Poliomyelitis, Showing Results of Treatment by the Placing of Intra-articular Silk Ligatures," Bernard Bartow, M.D., Buffalo.

Case 1. Both knees and ankles and left shoulder.

Case 2. Left shoulder, right hip and right ankle.

Case 3. Both feet.

"Cerebral Syphilis," J. W. Putnam, M.D., Buffalo.

"Poliomyelitis," L. Kauffman, M.D., Buffalo.

Case 1. Spinal type—biceps, triceps, and deltoid.

Case 2. Bulbous Pontine type—face.

"Surgical Clinic at Buffalo General Hospital," Roswell Park, M.D., Buffalo.

Case 1. Communicated fracture of both bones of right forearm and both bones of right leg.

Case 2. Estlander's operation.

"Einhorn's Bead Test as a Means of Estimating Intestinal Digestion," William G. Morgan, M.D., Washington, D. C.

Discussion by Drs. De Lancey Rochester and Allen A. Jones.

"Some Observations on Gastro-Intestinal Atony," Allen A. Jones, M.D., Buffalo.

Discussion by Drs. DeL. Rochester, William H. Thornton, William G. Morgan and A. L. Benedict.

A vote of thanks was extended to Dr. Morgan.

COUNTY SOCIETIES

MEDICAL SOCIETY OF THE COUNTY OF DUTCHESS.

ANNUAL MEETING AT POUGHKEEPSIE, OCTOBER 9, 1912.

BUSINESS SESSION.

The following officers were elected for the ensuing year: President, Marcus M. Lown, Rhinebeck; Vice-President, Louis C. Wood, Poughkeepsie; Secretary, Frederick J. Mann, Poughkeepsie; Assistant Secretary, John H. Dingman, Poughkeepsie; Treasurer, Lewis H. Marks, Poughkeepsie. Censors: D. H. MacKenzie, of Millbrook, and J. H. Cotter and H. P. Carpenter of Poughkeepsie. Delegates to State Society: J. C. Otis and A. L. Peckham, of Poughkeepsie. Alternate: J. A. Card, Poughkeepsie. Counsel: Hon. G. V. L. Spratt.

A letter from the State Society was read containing the resolution adopted by the State Society protesting against the giving or receiving of commissions for recommending patients requiring general or special treatment or surgical operations.

The following amendment to the By-Laws was presented: that "Chapter V, Section 3, be stricken out."

The following was adopted: "Resolved, that the Medical Society of the County of Dutchess requests its representatives in the House of Delegates of the Medical Society of the State of New York to use their influence and votes to secure prosecution by the State Society of all cases of illegal practice in the State of New York."

MEDICAL SOCIETY OF THE COUNTY OF CHAUTAUQUA.

TRI-ANNUAL MEETING AT WESTFIELD, OCTOBER 16, 1912.

SCIENTIFIC SESSION.

"Eclampsia," Garnett L. Hunter, M.D., Westfield.

"Some of the Newer Phases in the Treatment of Cancer" (illustrated with lantern slides), Wm. Seaman Bainbridge, M.D., New York City.

"The Treatment of High Blood Pressure," Fred C. Rice, M.D., Ripley.

MEDICAL SOCIETY OF THE COUNTY OF ORLEANS.

ANNUAL MEETING AT MEDINA, OCTOBER 1, 1912.

BUSINESS SESSION.

The following officers were elected for the ensuing year: President, Richard W. Bamber, Carlton; Vice-President, George F. Rogan, Medina; Secretary-Treasurer, J. Fred Eckerson, Shelby. Censors: E. Munson, L. Ogden and F. W. Storer. Delegate to State Society: John Taylor, Holley. Alternate: R. W. Bamber, Carlton.

SCIENTIFIC SESSION.

Talk on "The Diagnosis of Infantile Paralysis," N. G. Russell, M.D., Buffalo.

MEDICAL SOCIETY OF THE COUNTY OF
WARREN.ANNUAL MEETING AT GLENS FALLS, OCTOBER 9, 1912.
BUSINESS SESSION.

The following officers were elected for the ensuing year: President, Sidney A. Rowe, Glens Falls; Vice-President, Daniel L. Rogers, Bolton Landing; Secretary-Treasurer, Virgil D. Selleck, Glens Falls. Censors: J. A. Bean, J. W. Dean and J. E. Goodman, Jr. Delegate to State Society: M. L. Haviland, Glens Falls. Alternate: E. B. Probasco, Glens Falls.

MEDICAL SOCIETY OF THE COUNTY OF
SARATOGA.ANNUAL MEETING, SEPTEMBER 10, 1912, AT SARATOGA.
BUSINESS SESSION.

The following officers were elected for the ensuing year: President, John B. Ledlie, Saratoga Springs; Vice-President, John R. MacElroy, Jonesville; Secretary, James T. Sweetman, Jr., Ballston Spa; Treasurer, Thomas E. Bullard, Schuylerville. Censors: F. J. Sherman, F. F. Gow and D. C. Moriarta. Delegate to State Society: A. W. Johnson, Mechanicville.

MEDICAL SOCIETY OF THE COUNTY OF
WASHINGTON.ANNUAL MEETING AT HUDSON FALLS, OCTOBER 1, 1912.
BUSINESS SESSION.

The following officers were elected: President, Arthur E. Falkenbury, Whitehall; Vice-President, Alfred M. Young, Salem; Secretary, Silas J. Banker, Fort Edward; Treasurer, Russell C. Paris, Hudson Falls. Censors: W. B. Melick, J. T. Park and C. W. Sumner.

SCIENTIFIC SESSION.

"Presentation of a Case of Triplets," G. M. Stillman, M.D., Argyle.

Dr. W. A. Tenney of Granville also presented a case. President's Address; "The Masking Symptoms of Diabetes."

"M-Shaped Colon" (illustrated by X-ray photographs), J. H. Gutmann, M.D., Albany.

Dr. L. R. Oatman of Greenwich presented several surgical cases.

Lecture, illustrated by lantern slides, on "Water Pollution and Water Born Diseases," W. S. Magill, M.D., New York.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

INTERNAL MEDICINE. By DAVID BOVAIRD, JR., A.B., M.D., Assistant Professor of Clinical Medicine in the College of Physicians and Surgeons of Columbia University; Associate Visiting Physician of the Presbyterian Hospital, and Visiting Physician of the Seaside Hospital, in the City of New York. With one hundred illustrations in the text and seven colored plates. Philadelphia and London. J. B. Lippincott Company. Price, \$5.00.

BRAIN AND SPINAL CORD. A manual for the study of the Morphology and fibre-tracts of the central nervous system. By Dr. Med. EMIL VILLIGER, Privatdozent in Neurology and Neuropathology in the University of Basel. Translated by GEORGE A. PIERSOL, M.D., Sc.D., Professor of Anatomy in the University of Pennsylvania. From the third German edition, with two hundred and thirty-two illustrations. Philadelphia and London. J. B. Lippincott Company. Price, \$4.00.

A MANUAL OF AUSCULTATION AND PERCUSSION, embracing the physical diagnosis of diseases of the lungs and heart and of thoracic aneurysm and of other

parts. By AUSTIN FLINT, M.D., LL.D., late Professor of the Principles and Practice of Medicine and of Clinical Medicine in the Bellevue Hospital Medical College, etc. Sixth edition. Revised and enlarged by HAVEN EMERSON, A.M., M.D., Associate in Physiology and Associate in Medicine, College of Physicians and Surgeons of Columbia University; Assistant Visiting Physician, Bellevue Hospital. Illustrated. Lea & Febiger. Philadelphia and New York. 1912.

AN INTRODUCTION TO THE STUDY OF INFECTION AND IMMUNITY, including chapters on Serum Therapy, Vaccine Therapy, Chemotherapy and Serum Diagnosis, for students and practitioners. By CHARLES E. SIMON, B.A., M.D., Professor of Clinical Pathology and Experimental Medicine at the College of Physicians and Surgeons; Pathologist of the Union Protestant Infirmary and the Hospital for the Women of Maryland; Clinical Pathologist to the Mercy Hospital of Baltimore, Maryland. Illustrated. Lea & Febiger. Philadelphia and New York. 1912.

THERAPEUTICS, MATERIA MEDICA AND PHARMACY, including The Special Therapeutics of Diseases and Symptoms, The Physiological and Therapeutical Actions of Drugs, The Modern Materia Medica, Official and Practical Pharmacy, Minute Directions for Prescription Writing; also The Antidotal and Antagonistic Treatment of Poisoning. By SAMUEL O. L. POTTER, A.M., M.D., M.R.C.P. Lond. Formerly Professor of the Principles and Practice of Medicine in the Cooper Medical College of San Francisco; author of the "Quiz-Compend of Anatomy and Materia Medica," "An Index of Comparative Therapeutics," several articles in Foster's "Practical Therapeutics," and "Speech and Its Defects"; late Major and Surgeon of Volunteers, U. S. Army. Twelfth edition. Revised and enlarged. Philadelphia. P. Blakiston's Son & Co. Price, \$5.00 net.

A TREATISE ON FRACTURES AND DISLOCATIONS. By LEWIS A. STIMSON, B.A., M.D., LL.D., Professor of Surgery in Cornell University Medical College, New York. New (7th) edition, thoroughly revised. Octavo, 930 pages, with 459 engravings and 39 plates. Cloth, \$5.00 net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

THE PRACTITIONER'S VISITING LIST, 1913. Pocket-sized, containing memoranda, data and ruled blanks for recording details of practice. The weekly, monthly and 30-patient perpetual contain 32 pages of data and 160 pages of classified blanks. The 60-patient perpetual consists of 256 pages of blanks alone. Wallet-shaped book, in flexible leather, with flat and pocket, pencil, rubber, and calendar for two years. Price, postpaid, to any address, \$1.25. Thumb-letter index, 25 cents extra. Descriptive circular showing the several styles sent on request. Lea & Febiger, Publishers, Philadelphia and New York.

DEATHS.

WILLIAM BREWSTER CLARK, M.D., New York City, died October 11, 1912.

HERBERT W. DAVIS, M.D., Falconer, died September 17, 1912.

WILLIAM F. DUDLEY, M.D., Brooklyn, died October 28, 1912.

WILLIAM H. LOUGHHEAD, JR., M.D., Andover, died September 12, 1912.

HENRY E. OWEN, M.D., New York City, died October 12, 1912.

HERMAN B. STADT SINGER, M.D., Buffalo, died October 23, 1912.

GEORGE MONTGOMERY TUTTLE, M.D., New York City, died October 29, 1912.

JOHN W. WOODS, M.D., New York City, died October 28, 1912.

NEW YORK STATE JOURNAL OF MEDICINE

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Vol. XII.

DECEMBER, 1912

No. 12

EDITORIAL DEPARTMENT

THE EDUCATIONAL PIE

Little Dick Horner, sat in a corner
Eating a Christmas Pie.
He stuck in his thumb and pulled out a plum,
And said "What a good boy am I."

THE old nursery rhyme has had many a practical application since first it was sung to a nursery audience. Plums and pies have a pleasant sound to childish ears also to children of an older growth.

Just now the medical profession is having the privilege of listening to several Dick Horners who with intrusive thumbs are pulling large purple plums out of the medical pie, not for their own delectation but for us to swallow. We have already gorged one or two plums with somewhat of a gulp and a startled expression in our eyes, and we have murmured appreciatively in a sort of Pinafore chorus, "My, what a good boy is he."

Our Jack Horners, however, unlike modest Jack of Mother Goose fame do not sit in a corner. Quite the contrary. The market place is their seat of election with brass band accompaniment. Our Jack Horners have their portraits published in the Sunday editions of Metropolitan journals. They by no means hide their light under a bushel, but sit in public where they may be seen of all men, newspaper men preferred, with their supply of plums for the medical profession to swallow. To be sure, they know nothing about medicine except from hearsay. They have, perhaps a bowing acquaintance with the *Materia Medica*.

Perhaps they know salts from calomel and pneumonia from a cold in the head. This, of course, renders them entirely competent to advise the medical profession for its own good. They are able theorists with exceedingly expert thumbs which they insert in other people's pies with astonishing deftness. They have taught us a good many things which we knew perfectly well before their astonishing "discoveries" and they also know with exceeding accuracy not a few things which are not so. The medical profession listens with remarkable docility and ever and anon we hear again the murmur of the Pinafore chorus "My, what a good boy is he," to be echoed by press and people until we are coming to believe that whatever our Jack Horners say must certainly be true.

It was quite obvious to the medical profession that we had bad medical schools before the report of the Carnegie Institute. The American Medical Association was already busy in cleaning house long before we were berated in that report. It was quite obvious that a university connection was of advantage to a medical school—*provided* the university had ample funds. Lately, however, we have been offered some new educational plums which when we bite into, have an acrid and rather bitter taste and we are led to believe that our Jack Horners sometimes get hold of an unripe persimmon and mistake it for a plum. In these days, everybody seems to know more about the teaching of medicine

and what is best for hospitals, patients, medical students and medical men than the doctors themselves. It is written "The meek shall inherit the earth." The medical profession is certainly entering upon its heritage or deserves to, which if not quite the same, is consoling to our self-esteem. We are told that no medical student is to be licensed until he has had a year in the hospital. What the effect of this dictum is going to be on the internal economy of the hospital and the patients does not seem to matter. The plum has an unripe taste. Some of us think it distinctly green. The hospital also is to be the appanage of a university. That is to say, the hospital trustees are to pay the bills and the university is to do the rest. What is to be the outcome of the divided financial responsibility, no one seems to consider. Perhaps this is a trifle not worth considering. And now the final and most purple plum of all is held up to our admiring gaze, just in front of our mouths, which are watering with eagerness and anticipation. The hospital visiting staff, we are told is to devote its services exclusively to the hospital and to teaching. This plum no doubt will be swallowed with avidity by our metropolitan professors of medicine, surgery and obstetrics. Everyone knows the salaries which are enjoyed by university professors in this country. Few of them reach the moderate sum of \$5,000. We can imagine the joy with which our friends who are teaching medicine, surgery and obstetrics in metropolitan schools will welcome this particular plum. With altruism unbounded and a becoming philosophy and resignation they will welcome the curtailment of their incomes. Few of our teachers in clinical subjects in New York Schools have incomes less than \$25,000 per annum. Probably the average will be greater than that. If these gentlemen are to be invited to abandon their lucrative private practices, it is quite certain that somebody will have to finance the situation. Great teachers in this country are invariably men with a large private clientele. They are now invited to abandon the fruits of their toil and work for the hospital exclusively, on the salary of a university professor. One can hear the tread of their eager feet as they rush to seize the boon which is offered to them.

We are too apt in our enthusiasm for betterments to forget that questions such as these are largely questions of finance. It is only in recent years that the hospital has begun to pay the pathologist. It found that it either had to pay or go without, since as pathology was not a clinical science it brought no emolument in its train and the pathologist had to have a salary to live. It is so with the radiographer. It will be so with the professional anesthetist. Our hospital histories are bad. They will never be what they ought to be until we have paid stenographers, typewriters and a salaried historian instead of depending as at present on the youngest member of the house staff to write an intelligent and legible history.

Why should medicine be economically different from any other science or occupation? It was Pharaoh who compelled his slaves to make bricks without straw, and his name has been a by word ever since. The betterments which are being so loudly demanded in hospital and medical school have got to be financed. Nobody, however, seems to think this trifling circumstance worth mentioning. The medical profession is requested to make bricks without straw and live on husks afterward. We trust in time that we shall learn these simple and rather obvious facts, also that the medical profession is perhaps almost competent to handle its own affairs, without even "a little help from mother."

STATE MEDICINE IN GREAT BRITAIN.

WHAT is called lodge practice in this country in England is known as club practice. The so-called "Friendly Societies" take the place of our lodges of Red Men, Foresters, etc., and these societies have what is called a Friendly Societies Medical Alliance. The annual fees appear to be not very different from those of the lodges in this country which are evidently patterned after their prototypes abroad. Lloyd George's National Insurance Bill is in effect an attempt on the part of the State to nationalize club or lodge practice for the benefit of "persons employed," to use the terms of the bill. The insurance is compulsory for certain classes of the employed, voluntary for certain other classes. As the bill was originally framed it did not appear that there was any in-

come limit to prevent people of means from applying for medical benefits under the law. Thus Lloyd George himself stated that if the Governor of the Bank of England or the Chancellor of the Exchequer desired to avail themselves of the benefits of the bill they could do so. Moreover, what has seemed highly objectionable to the doctors was the clause in the bill which entrusted the administration of the benefits of the bill, sickness benefit, disablement benefit, maternity benefit and medical benefit (free attendance) to "approved societies" (Friendly Societies). Only Friendly Societies of at least 10,000 members, insured persons are to be considered as "approved." Such societies must also be incorporated and comply with certain other legal requirements. The rate per capita which the government offered the doctor was 6s. per annum for each insured. This was to furnish free medical attendance as often as necessary in the year. As stated in the "Memorial of Members of the Medical Profession to the Government":

"The bill contemplates the perpetuation and extension as part of a state scheme of those arrangements by friendly societies for the employment and control of medical practitioners to treat their members, which have already given rise to grave dissatisfaction in the medical profession, even on the more limited scale upon which such arrangements are at present conducted."

This involves what is in effect, the nationalization of lodge practice. A scheme so unfair to the medical profession has met with the strongest opposition from the English practitioners who are fighting certain provisions of the bill under the aegis of the British Medical Association. Every medical man in America ought to be interested in the struggle which is going on in Great Britain between the Government and the British Medical Association. A full account of the proceedings of the British Medical Association, through its Representative Body (House of Delegates) may be found in the supplements to the *Journal of the British Medical Association* for the current year. The bill has been described as one which attacked the independence of private practice and indeed destroyed its foundations and offered, not contract practice under proper conditions for those who desire it, but the State Establishment of ill-paid sweated contract practice under lay control (the Friendly Societies).

There are two reasons why we think the medical profession of this country should take an interest in this struggle. First, because the specter of lodge practice is already among us with all its evils. Second, because we may profitably and thoughtfully compare the magnificent activity of the British Medical Association and its constituent branches with the relative apathy and inaction shown by our own state and national organizations in this country when the material welfare of the medical profession is concerned. The following is the "undertaking" signed by some 26,000 members of the medical profession in Great Britain:

"I, the undersigned, hereby undertake that in the event of the National Insurance Bill becoming law, I will not enter into any agreement for giving medical attendance and treatment to persons insured under the bill excepting such as shall be satisfactory to the medical profession and in accordance with the declared policy of the British Medical Association; and that I will enter into such agreement only through a local Medical Committee representative of the medical profession in the district in which I practice and will not enter into any individual or separate agreement with any approved Society, or other body for the treatment of such persons."

It is, of course, understood that the government has no power to compel the doctors to enter into its insurance scheme. It can only invite them. So far, its terms have been humiliating and savoring of the sweat shop, and the British Medical Association is engaged in a struggle to bring about an arrangement which, while approving of the principle of State insurance for sickness, will nevertheless protect the medical profession against cruel injustice and wrong.

In England the medical profession long ago learned that the function of the British Medical Association must be not only one of education but of protection also. We have not learned that lesson in this country. Our national and state associations concern themselves almost wholly with scientific questions and those of public health. The doctor himself is largely neglected. Perhaps this is one reason why our national association numbers among its members but one-fourth of the entire medical profession of this country, our own State Society a little more than half of the eligible practitioners in the State.

Original Articles

DEAFNESS RESULTING FROM
MIDDLE EAR DISEASE.*By SAMUEL J. KOPETZKY, M.D.,
NEW YORK CITY.

TO understand why 98 per cent. of all cases of chronic progressive deafness is due in whole or in part to middle ear disease, we must study the evolution of the pathologic process as it unrolls itself in the middle ear. We comprehend easily enough the factors producing this symptom during the onset and continuance of the middle ear suppuration, but, at the first glance, as we study the many cases which later in life's course present themselves to us for relief, and whose infirmity makes them a burden alike to their surroundings and to themselves, we sometimes fail to recognize the relationship of the suppuration many years previously and the deafness now at hand.

The few remarks I make, therefore, while they bring nothing new to the topic assigned me in this symposium, may help to point the lesson that the basis of much of this deficiency in hearing is laid during the years of early childhood, and to a considerable extent it is a preventable condition.

All in all, acute and chronic middle ear suppuration are responsible for most cases of deafness. Virulent micro-organisms, gaining a foothold in the tympanic cavity, more particularly in the delicate and still partly embryonic tissues of the infant's middle ear, result in a suppuration of the mucous membrane. In etiological relationship we further find the presence of diseased tonsils and lymphoid tissue of nasopharynx. The associated inflammation of the Eustachian tube results in tubal obstruction, and drainage and aeration of the middle ear spaces are interrupted. Incidentally, in older patients, abnormalities of the nose are also causative factors.

Glancing at the pathologic process as it takes place, and tracing its various component elements, we find that the inflammatory involvement of the mucous membrane lining the Eustachian tube is the first element. The tympanic cavity is closed off by the swelling of the pharynx. The air in the tympanic cavity becomes absorbed by factors which operate similarly to those absorbing the air in pneumothorax. Negative pressure which then results is compensated for by an outpouring of sterile transudate which, upon the advent of pathogenic micro-organisms, results in a purulent exudate.

Then, either spontaneously or by surgical means, egress is provided for this pus and the otorrhea is established.

Assuming recession, or resolution, to take place,—after a time the suppuration runs its course, the virulence of the microbic elements is lessened and they are eventually disposed of by the body fluids. The drum-head heals. As a result of this inflammatory reaction there is a general small cell infiltrate of the mucous tissue, which may or may not entirely recede. When full re-establishment of normal conditions supervene no deafness results. On the other hand, when, because of improper or faulty treatment, new connective tissue elements are produced, permanent thickening of the membrane results and adhesive bands form. Where, because of the character of the exudate, mucous surfaces are destroyed, the epithelium layer macerated, and ulcerative processes result, we naturally expect adhesive processes, and scar tissue to be deposited. Upon full organization of the adhesions interference with the interaction of the ossicular chain, and the functioning of the small muscles, result and all this produces the *predominating symptom*,—deafness.

Furthermore, if the suppuration advances to the mastoid process, the purulent products of bacterial activity accumulate until they exert pressure on the retaining cell wall of the mastoid cells, the pressure exerted finally shuts off the local blood supply, the inter-cellular bony walls of the mastoid cells coalesce, and necrosis of bone results. In the cases where eventual resolution of the process supervenes, the entire mass of inflammatory exudate in the process becomes partly absorbed and partly organized, and in the element of organization there seems to be the tendency toward the formation of the adhesive process, which we again recognize, as the factors of interference to function, as the cause of the deficiency in hearing.

Finally, we have the cases which from the time of the onset of the suppuration, have persisted in exhibiting a more or less continuous otorrhea. In these cases the destruction of the bone elements continues the process which we outlined above. The process takes on a slower course and, as the bone becomes changed, the mucous membrane covering it undergoes degenerative changes and here and there on the contiguity of its surface mucous excrescences, or polypoid enlargements, appear. The destruction finally takes in the ossicles, which may in varying degrees be destroyed, leaving only parts *in situ* to attempt the performance of the physiologic function. All sorts of inflammatory adhesive bands may be formed and all these factors, or any part of them, act to inhibit normal function, and produce deafness.

The process being of long duration the deficiency in hearing is evidenced early, and the internal ear secondarily becomes affected.

In passing, I may remark, although not entirely within the scope of my part of this symposium, that in a limited number of cases of

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acute, and also chronic, middle ear suppuration in patients who possess a tendency to otosclerosis, an infection anywhere in the body may be the determining factor which starts this inherited tendency into activity, and the acute purulent involvements of the tympanic cavity must not be overlooked as factors in the production of deafness which is symptomatic of otosclerosis.

Having thus sketched the pathologic features,—a sketch which is by no means to be taken as a complete analysis of the pathology in question—we will pass to a consideration of some of the diseases found in causal relationship to deafness because they are etiologically factors in producing the conditions described above.

Scarlet Fever.—The statement is not exaggerated that the institutions for the deaf mute are recruited almost exclusively from the ranks of those who have recovered from an acute infectious disease. The principal cause of acquired deafness,—according to the recent investigations of Kano (1910)—next to diseases of the brain and cerebral meninges, consists in scarlet fever and measles. Although cerebral spinal meningitis is equally destructive to the organ of hearing it is less widely distributed, and scarlatinous otitis may, therefore, be considered as the most dangerous and far-reaching among the secondary ear inflammations. Among the infectious diseases that lead to deafmutism scarlet fever ranks first in order, as testified to by the inmates of deaf mute asylums—for, in the very young, the loss of hearing involves at the same time the loss of speech.

Scarlatinous otitis media occupies a position apart, on account of its grave sequelæ. In many cases the condition passes beyond a simple inflammation of the middle ear. In the gravest type the inflammation is probably of hematogenous origin. Severe middle ear suppuration begins at once with the onset of the eruption, and even before the tympanic membrane has ruptured, the annular ligament of the stapes is broken down and the process extends to the labyrinth.

According to the virulence of the infectious agents, or the character of the individual epidemics, the symptoms may run a mild course and terminate in recovery; but sometimes the absence of pain in the beginning causes the middle ear inflammation to be overlooked until suppuration has set in and started its destructive work on the structure of the middle ear.

Scarlatinous otitis is divided, according to its course, into an early form which begins with, or even before, the onset of the eruption, and a relatively mild late form, which manifests itself in the organism deprived of its resistive power. The early type may begin without pain, the patient complaining only of pressure and fullness in the ear, probably with some hardness

of hearing. In this way very extensive destructions of the middle ear and accessory cavities are sometimes produced while the tympanic membrane remains intact, or at most is softened and exudes a little light fluid. In the absence of threatening symptoms the ear escapes attention until this stage becomes aggravated and assumes the character of acute otitis media, or until rupture of the tympanic membrane occurs. In this stage of scarlatinous otitis early paracentesis is much more promising of good results than is spontaneous rupture. Even the best and timeliest treatment fails to arrest the destructive form of otitis, but the consequences are worse still without prompt interference, for the early performance of paracentesis may at least weaken the virulence of the process. The development of deafness, or extreme hardness of hearing, is fully accounted for by the extensive destruction in the middle ear and also in the labyrinth. Besides the breaking down of the tympanic membrane and the auditory ossicles, there is swelling and ulceration of the tympanic mucosa with involvement of the bone, especially the labyrinth wall, formation of polyps and adhesions, establishment of bone fistulæ, and sequestration of entire segments of the ear. Neuritis of the acoustic nerve may follow as a result of the general infection with the scarlatinous virus or its toxins. The worst havoc in the auditory organ is wrought through the extensive suppuration associated with the necrotic, or diphtheritic, form of scarlatinous otitis. The outcome is practically always a chronic middle ear suppuration, followed by deafness, if the ear involvement does not lead to death.

Holmgren, at the First Northern Otolaryngological Congress, held in Copenhagen in August, 1911, pointed out that 27 per cent. of all cases of deafmutism in Norway are referable to scarlatinous otitis. His review of 9,500 cases of scarlet fever showed 2,000 cases with otitis, equaling twenty-two per cent. The younger the patient the greater this susceptibility, which diminishes notably after the third or fourth year of life.

Measles.—A fair contingent to the total of middle ear deafness, and deaf mutes, is furnished by measles. Only a very small number of cases remain entirely free from an involvement of the ear. Careful statistical investigations, conducted by Nadoleczny in 1906, showed that inflammatory middle ear affections are present in 59 per cent. of all cases of measles. Among these, 12.7 per cent. concern acute catarrhal inflammation; with relatively mild congestive symptoms and inflammation of Shrapnell's membrane, without bulging; 33.7 per cent. have acute otitis media, with severe inflammatory symptoms, bulging, fever and pain; in 13.1 per cent. there is acute middle ear suppuration. Mild subacute inflammatory symptoms were noted in nearly all of the remaining 40.5 per

cent. The middle ear complication in measles is sometimes delayed until the stage of desquamation, but usually occurs in the week of eruption, in the first or second week of the disease, at a time when the ear is most apt to escape attention. Sometimes the trouble is not perceived until spontaneous rupture of the tympanic membrane has taken place, at the point of greatest bulging, usually between the two posterior quadrants. The course of rubellar otitis varies like that of genuine otitis media, from the mild, catarrhal form with a clear serous exudate, to the entire symptom complex of genuine acute middle ear inflammation. All these manifestations tend to subside promptly after paracentesis or spontaneous rupture. Rubellar otitis runs its course in an average period of three weeks. Although the outcome is usually favorable, severe complications may follow, due to rapid destruction of the entire tympanic membrane, or numerous perforations of the same. Thus the middle ear involvement may lead to diminution of or loss of hearing. A neglected middle ear suppuration is very apt to pass into the chronic stage and result in deafness, which might have been avoided under appropriate treatment. The catarrhal form of rubellar otitis is still more apt to become chronic,—probably because treatment is often omitted or too long delayed—on account of the mild course.

Among 6,000 cases of infectious fevers at the Willard Parker Hospital, treated under the most favorable conditions, acute purulent otitis media developed in 5 per cent. of the cases of measles, in 10 per cent. of the diphtheria cases, and in 20 per cent. of the cases of scarlet fever; in measles and diphtheria in the acute stage, and in scarlet fever during the second or third week, when the throat congestion is increased after exposure.

Changes of the auditory organ, mostly acute otitis media, more rarely tubal catarrh, were found by Lewin in 38 of 60 clinical cases of genuine diphtheria. The middle ear inflammation was always mild in character, generally non-specific, and rarely led to rupture of the tympanic membrane. The ear involvement was usually present in the first days of the disease,—sometimes prior to the onset of the throat symptoms.

Typhoid Fever.—The middle ear is the seat of predilection for the inflammatory changes in the auditory organ due to typhoid infection,—according to Benzold, who found either pus, serous fluid or mucous in the tympanic cavity, or the tympanic mucosa was congested, swollen and hemorrhagic. Even in cases with negative findings during life, pus is often demonstrated post mortem in the tympanic cavity. The ear involvement is usually explained as the result of propagation from the upper air passages through the Eustachian tube and may assume

any type, from the catarrhal form to acute inflammation and suppuration. The chief characteristic of typhoid ear suppuration consists in the tendency to involvement of the mastoid process and antrum, which sometimes remains latent for a long time. Seeing that the mastoid involvement can be prevented by timely performance of paracentesis, repeated examinations are indicated for all somnolent patients who are unable to make any statements concerning their ear symptoms. The pain and inflammation do not subside so promptly after paracentesis or spontaneous rupture as in ordinary middle ear inflammation, but the outcome of typhoid otitis is usually favorable. In a number of the cases, however, the hearing capacity is diminished down to absolute deafness, although the disease does not present the destructive character of scarlatinous otitis. The deafness is often due to a combination of the middle ear process with labyrinthitis, or to primary inflammation of the labyrinth.

According to the severity of the epidemic, there are typhoid fever epidemics without ear involvement, and others in which complications on the part of the ear manifest themselves in a more or less considerable fraction of all typhoid fever cases. In severe cases of acute typhoid otitis media the symptoms of meningeal irritation may simulate a typhoid relapse, so that the middle ear inflammation is overlooked and irretrievable damage is done to the hearing function.

Pertussis.—Deafness may be the result of hemorrhages into the middle ear mucosa in whooping cough, which is not uncommonly associated with ear disease. A mild catarrhal otitis media results in the early stage, through an extension of the catarrh from the upper respiratory passages to the tube and middle ear. Acute suppurative otitis media may follow, upon the entrance of infectious matter into the middle ear through violent coughing fits, and in the convulsive stage of pertussis hemorrhages are apt to take place into the various segments of the ear, including the tympanic membrane, which may be ruptured, leading to middle ear inflammation.

Certain other diseases, such as chicken pox, smallpox, and osteomyelitis, may be also followed by middle ear deafness. In children under four years of age broncho-pneumonia, influenza, attacks of tonsillitis or enteric fever, are apt to be associated with acute middle ear inflammation and otorrhea without any evidence of pain. The neglect of such cases, as pointed out by Yearsley, is a potent cause of middle ear deafness in adult life. In his paper entitled "The Duty of the General Practitioner to the Deaf Child" (*The Lancet*, September 10, 1910), he says: "A middle ear discharge is a serious matter and treatment should never be relaxed so long as there is a drop of pus in the meatus."

Deafmutism after simple middle ear suppuration, in the train of coryza, angina, etc., was denied until recently, with the idea that a predisposing constitutional dyscrasia was necessarily requisite, such as scarlet fever, rachitis, tuberculosis, syphilis. It has been shown, however, that genuine middle ear suppuration may be followed by tympanic and labyrinthic suppuration, even in cases where the windows show no solution of continuity.

The pathologico-anatomical changes in the adhesive processes which follow upon middle ear catarrh may be distributed over the entire middle ear mucosa or remain limited to circumscribed portions of the tympanic cavity. The vibratory capacity of the sound-conducting apparatus is thus impaired to a variable degree, the most serious outcome in the middle ear consisting in connective tissue, or bony adhesions, of the stapes with the walls of the niche of the vestibular window. Pathological changes of the cochlear window are equally important and far-reaching in their effects. The degree of the hearing disturbance depends mostly upon the size of the obstacle to sound-conduction and the simultaneous changes in the labyrinth.

Deafness, in the majority of cases, is due to agglutinating processes in the middle ear, and otosclerosis.

In the prophylaxis of middle ear deafness the simple cases of congestive, or catarrhal, otitis media are perhaps the most important. Although the attacks occur with more or less frequency, they are often so mild as to be overlooked until the establishment of chronic catarrhal otitis media. Again, many patients with acute purulent otitis media are so incompletely treated that irreparable damage is done to the hearing through the endless suppuration. These repeated attacks of acute middle ear inflammation, especially the exudative form, with involvement of the nasopharynx, are chiefly responsible for the changes in the ear which finally lead to deafness. The impeded nasal respiration leads first to inflammation of the tube, then to simple chronic otitis media with more or less discharge, until one of the most important special senses is impaired, or forever lost.

The number of persons afflicted with deafness—or at least hardness of hearing—is much greater than is usually assumed. According to von Troeltsch, one adult among three, taken at random, has more or less trouble with his ears—usually dating back to childhood. Wilde showed that among 503 deaf adults 411 had begun to hear badly since the age of seven years. Among 100 school children 20 are said to hear more or less imperfectly. Lavarenne, in compiling the statistics of the French army, found that among 300,000 recruits 2,500 are rejected, or conditionally enlisted, annually, on account of deafness. Females suffer in the same proportion. In France, among 600,000

persons at the age of 20 years, 5,000 have already become deaf. These figures are so eloquent as to render all comment superfluous.

In conclusion, if this recital of the factors and diseases resulting in deafness from middle ear disease carries any lesson it must be that every suppurative process in the middle ear must be continuously treated until it subsides. Thereafter, the case must not be discharged but efforts must at once be instituted to re-establish normal functional activity in the ear.

The manner of this treatment will not be gone into here. Suffice it to indicate that besides re-establishing the potency of the Eustachian tube, the removal of diseased tissue in the nose and nasopharynx is of importance, not only to help the re-establishment of normal hearing, but to prevent the recurrence of the suppuration in the middle ear cavities.

DEAFNESS AS A RESULT OF DIATHETIC AND CONSTITUTIONAL CONDITIONS.*

By SARGENT F. SNOW, M.D.,

SYRACUSE.

IN taking up the subject of diathetic and constitutional causes of deafness, I would warn you that the ideas that I shall express are largely the result of conclusions from my own experience and being personal deductions, I will not ask you to accept them as authoritative.

It seems to the author that we cannot emphasize too strongly the importance of recognizing the systemic factors of deafness, and that those who attempt to conduct a case from a purely local standpoint are doomed to failure from the onset. We must realize that the general system plays a most prominent part.

The causes of deafness may well be classed as operable and constitutional. Under operable causes, I would include those nasal and pharyngeal conditions that predispose to pressures and congestion in the upper air passages.

Too much cannot be said of the utility of efforts to improve catarrhal states in these anti-chambers of the ear and the benefits that come to the deep aural structures from a proper clearing out of the nasal and pharyngeal passages. This subject though, has been so well handled in books at our command, and will be so well handled by others in this symposium, that I will not take it up further than to say that every step must be thorough and complete, and that to rhinological surgery, otology will always owe a debt not to be forgotten.

Under constitutional causes, I would men-

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tion first of all, auto-intoxication—specific and tubercular cases are so infrequent as to need only a mention. If I did not fear I would be considered too revolutionary, I would place auto-intoxication as the predetermining diathetic cause in all cases of catarrhal deafness that become extreme or chronic, and call such a deafness autotoxic instead of catarrhal.

Modern progress in medical science, both from clinical and laboratory research, is showing that self-poisoning (auto-intoxication) is responsible for most of our bodily ailments. Be the affliction a simple cold or a grave infectious disease, the chances are that our natural antitoxins would have protected us against bacterial invasion had our glandular and antibody activities been up to a normal standard. The same principles for reasoning and treatment can be applied when we come to consider those insidious catarrhal states that lead to chronic deafness.

An occluded passage, or a pressure on some sensitive nasal area we know is apt to produce catarrhal states within the middle ear, but if that state is to progress ultimately to an advanced chronic deafness, some depressing organopathic influence must be at work, or the natural vital trend toward recovery will make the affliction but temporary.

In other words, an abnormal nasal or pharyngeal state present in an auto-intoxicated deaf patient, whose skin is of a pale gray or dirty color, whose tongue is coated posteriorly, whose breath is foul, who has a constipated habit and shows other evidences of functional inactivity, is not one to clear up by simply attending to abnormal nasal or pharyngeal states. In such a case, without question, we will have to deal with their self-poisoning, as well as with their intra-nasal pressures and pharyngeal obstructions.

Auto-intoxicated patients, male or female, present much the same general appearance. Accompanying their deafness, there is a multiplicity of disorders. They are often prematurely aged, lips too red for the complexion, skin sometimes spotted, conjunctiva yellow, appetite irregular and stools hard or mushy, with a strong putrefactive odor.

Cases of autotoxic deafness are common, and according to the writer's opinion, comprise these in which the determining factor is a toxæmia produced through vital processes of the organs or tissues of the body. Commonly, auto-intoxication is a condition made possible because the secretions of the liver and intestinal mucosa have not sufficient strength and quantity to keep the bacteria of the lower bowel under subjection. These bacteria seem to have been designed by nature to complete the processes of digestion, depending upon the inhibitory influence of the

glands above, to sustain the proper balance and protect us from danger.

In self poisoned cases an elimination of accumulated enterotoxins must occur, and when this elimination is attempted through the head membranes, it leads to more or less permanent thickenings and the activity in catarrhal states so much noticed in the development of a chronic deafness. In other words, the elimination of enterotoxins through the nasal and aural mucosa induces frequent inflammations of these parts.

Autotoxic energy exerted thus along a special course predisposes to catarrhal states that lead to deafness.

In auto-intoxicated cases, elimination of accumulated enterotoxins by the different excretories of the body must be fairly complete each day or some acute crisis will be precipitated. Such an acute crisis is probably for the purpose of destroying these accumulated poisons, and may be a simple cold with fever, a diarrhœa, an eruption or a sick headache, and so on through a long list of neurotic and organic disturbances.

These acute autotoxic crisis or expressions, are commonly periodic, as the enterotoxins tend to accumulate every one or two weeks in people who have an acquired or an inherited functional inactivity—a fact of clinical and therapeutic importance.

It is astonishing to note how quickly some acute expression will show itself in the head or throat from even a temporary stasis of the intestinal contents in the ascending or transverse colon. Sometimes within twenty-four hours, an active pharyngitis or rhinitis will be manifest.

So excellent an authority as Combe, in his book on Intestinal Auto-intoxication (p. 110), states that a partial stasis in the cecum or ascending colon is sufficient to bring about an *intense* auto-intoxication, and he explains why the stasis in the lower bowel, because of the dryness in the fecal matters, is not followed by *active* auto-toxis expressions.

All otological workers are balked in their efforts to improve the hearing if head colds and the recurring congestion of the nasal membranes persist after the breath passages have been relieved of hypertrophies, deflections and sinus discharges. Recurring congestions of this sort are common in those cases of deafness that are to become extreme and chronic, and it is to the control of pernicious auto-intoxications that effort will have to be directed if we are to stop their having frequent colds and inflammatory exacerbations.

The question of why we take cold is one of the live issues of our specialty. Handle it the otologist must, or we go down to defeat; and I may say with all the emphasis at my command that the problem is practically solved if we keep the

liver and bowel functions close to the normal. Personally, I wake up the liver with a mercurial once a week if the tongue or conjunctiva indicate torpidity of that organ, regardless of the claims the patient may make of regular bowel movement. If they are taking cold easily, it is evidence presumptive that their functional activities are not up to the normal.

Unfortunately, patients with digestive features are hard to manage and their deafness will prove intractable when once well started if we do not obtain sufficient influence over them to curb their diet and personal habits. If autotoxic manifestations are extreme, the active intestinal putrefaction must be diminished either by substituting foods rich in carbohydrates for, or freely mixing them with nitrogenous elements.

Those excellent autotoxic barriers, the intestinal mucosa and the liver, if kept in a healthy state allow a good latitude as to what we can eat, but if these organs are incapacitated or have an inherited tendency to weakness, our system has small chance of running the gauntlet without trouble.

The fact that there are bowel movements each day, or twice a day, should not satisfy us if we note that the patient has a furred tongue, inflamed membranes and a sallow, dirty complexion. All excretory channels must be made to do better work. Clean tongues and pink skins are usually fair weather signals.

For elimination the author uses either mercury in the form of calomel triturated or a blue mass and colocynth compound. These are effective remedial agents in preventing and correcting toxæmias if used vigorously once or twice a week, according to indications. Calomel, we know, not only eliminates autoinfective material, but it disinfects the lower bowel. It also stimulates functional activity of the liver and of the glandular structures of the body, so that their secretions and antibodies act as effective antitoxins against bacterial invasion with consequent active membrane congestions.

Anticipating an autotoxic crisis, or a loading up of the system by the administering of such an agent as calomel, saves our patient acute suffering, makes him less sensitive to colds and protects him from the ravages of chronic afflictions.

The author has a well fixed belief that many people when born have a tendency toward auto-intoxication, and that they will have to be guided and guarded in a direct ratio with that diathesis. These are the people most prone to chronic aural troubles.

The X-ray and abdominal surgery gives good promise of a better conception of the physical causes of auto-intoxication and the more permanent relief of those so afflicted. Radiographs taken at varying intervals after the bismuth meal show how frequently the transverse colon is prolapsed and the extreme angle over which the intestinal contents have to pass at the splenic flex-

ure. Instances are common where the transverse colon actually becomes an ascending colon, paralleling the descending colon from eight to twelve inches in the splenic region. Such a position of these organs and the narrowing of the channel at the flexure can only result in the slowing of the current through this susceptible portion of the bowel with consequent frequent absorption of irritating toxic products sufficient to balk our efforts toward the relief of membrane congestions. These intestinal mal-positions, induced perhaps by tight lacing, loss of flesh or relaxed abdominal walls, actually create a diathesis or predisposition to catarrhal states that may chronically affect any membrane of the body.

A case of chronic otitis media under the author's treatment resisted all attempts at correcting the auto-intoxication, both by himself and by two excellent general practitioners, until in despair surgical relief was finally decided upon, under the belief that a displaced kidney had carried a loop of the intestine down with it to its location in the pelvis, and this proved to be the fact, as the cecum and kidney both were found within the pelvic cavity. These organs were replaced last July by Dr. A. B. Miller, the kidney stitched in place, and the patient has made a fine recovery, not only from the operative procedure, but her tongue remains clean, her bowels are regular without cathartics, her complexion is becoming pink and the deafness is clearing up with but little local treatment; there is also promise of much improvement in her general health.

Pardon the digression if I observe that there is still much to be learned regarding the proper and best stimulants for arousing the antitoxin producing elements of the body. Clinical research along this line is open to all and very encouraging. Laboratory investigations are showing great merit, but of equally great merit can be the clinical investigation of an observing, thinking practitioner; each is legitimate and worthy of respect.

Two lines of effort appear to be open to medical men. Those qualified and equipped for laboratory work may well continue their search for serum antitoxins, while the general practitioner may be encouraged in his search for agents to wake up the glandular system of the body so that we manufacture our own antibodies or antitoxins. Both lines of effort deserve the highest respect and commendation.

Through a desire to be brief, my deductions may be so worded as to appear dogmatic, but I can assure you that they have been arrived at only after careful, painstaking clinical observation, and as such are submitted for your consideration.

In summing up, I would respectfully add that fifteen years of effort on chronic intractable cases of deafness has proved that to retain and make permanent the results secured from local work we must correct systemic faults, and that

diathetic influences are apt to be chief pre-determining causes in our most intractable cases.

In no way would I decry efforts towards treating the chronically deaf, for experience shows that 15 per cent. of those who persevere in treatment are practically cured, and that another 40 per cent. can be satisfactorily benefited. This surely justifies us in attempting to help all who seek relief. Persistent stimulation of the degenerated membranes of the middle ear by interrupted jets of vapor from a super-saturated solution of camphor and iodine twice a week, for five minutes at each sitting, is of much value, if such routine be carried out after the surgical and constitutional features of the case are out of the way.

CONGENITAL, TRAUMATIC, AND TOXIC CAUSES OF DEAFNESS.*

By ARTHUR G. ROOT, M.D.,

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IN considering the causes of deafness under the three heads, congenital, traumatic and toxic, it is not intended to convey the idea that these etiological factors are in any way closely related or that they rest upon a common basis. The matter is presented in this disjointed fashion with the idea of bringing more clearly before the mind the salient features of these widely different causative agencies and of combining in one paper a discussion of some of those otological problems which confront the general practitioner, and which he fails to find systematically treated in the one or two text books which he may have at his command.

Of the three headings, it will be natural to treat first that one which impresses us with its greatest importance. Today the problem of heredity looms up large in the field of medicine. Mendelism has invaded all the specialties and it seems that the immense amount of data collected on the subject of hereditary deafness is at last in a fair way to be scientifically interpreted. Right at this point it is well to draw attention to the definition of the terms congenital and hereditary. By congenital deafness we mean, broadly speaking, all cases that are born deaf. These may not necessarily be hereditary. Intra uterine local inflammatory conditions may cause deafness at birth. Imperfect absorption of the embryonic jelly filling the tympanum may cause various forms of adhesions to the promitory, and thus give rise to congenital deafness which is not inherited. However, it would seem that for practical purposes all congenital deafness is to be regarded as in some degree hereditary. E. A. Fay has collected statistics of the heredity of deafness in this country and combined the results of his researches in an exhaustive treatise which he calls the "Marriage of the Deaf

in the United States." He finds that marriages of deaf persons, one or both partners being deaf, (taken as a whole, without regard to the character of the deafness), are more liable to result in deaf offspring than ordinary marriages. The proportion of marriages of deaf persons resulting in deaf offspring is 9.7 per cent., and the proportion of deaf children born therefrom is 8.6 per cent. When both parents are congenitally deaf 24.7 per cent. of the marriages yield some deaf offspring, and of the total offspring 25.9 per cent. are deaf. Now, if the contracting partners belong to the same deaf mute strain, the liability to deafness is greatly increased, rising in such instances to 45 per cent. of such unions which yield deaf offspring, and of the total offspring 30 per cent. are deaf. In the Netherlands deaf mutes were found to have descended from a deaf mute strain in 13.5 per cent. of the cases. Among 558 deaf mutes Kreidl and Alexander ascertained that deaf mutism occurred in 36.7 per cent. of the cases when the parents were blood relations, also that deaf mutism occurred in 2.3 per cent. of the cases when the parents were deaf mutes, hard of hearing, or had mental affections, and finally, that deaf mutism occurred in 13.3 per cent. of the cases where the marriages were between blood relations in whom there was a tainted strain manifesting itself either as some degree of deafness or mental affection. Thus we have proven statistically the almost universal impression that consanguinity in marriage has a tendency to produce deafness.

Whereas the older belief denies the possibility of inherited deafness except in those cases which are due to some congenital malformation or where the deafness is part of a general expression of intellectual deficiency, there seems now to be a tendency to regard the absence of resistance to infection and inflammation of the lining membrane of the ear as a "unit character," and as such, to be capable of transmission. In support of this contention Bell (1906) has shown that in the census returns over 55 per cent. of deaf children in the country came from parents who become deaf in adult life. Thus the idea that heredity may play a part even in catarrhal deafness is not to be lightly cast aside. In that severe form of chronic catarrhal deafness accompanied by sclerosis the element of family predisposition is certainly a factor with which to reckon. We all know families many of whose members become hard of hearing as they grow older. The deafness is frequently attributed to climatic causes, and undoubtedly unfavorable atmospheric conditions may aggravate the condition, yet, notwithstanding the occurrence of many such cases in the same locality, inquiry will often develop the fact that the affected persons are relatives, and that their neighbors of different family stock are unaffected by the same climate.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

It may be safely said that the practitioner should consider the possibility of inherited congenital defect in every case of chronic deafness which comes under his care. Careful inquiry into family history will serve to establish the significance of this factor and aid in the formation of an intelligent prognosis. In those cases of congenital deafness where there is an obvious congenital malformation, a painstaking examination will serve to demonstrate whether or not the perceiving apparatus is intact, and in such event, what good may be expected from operative procedure to correct the malformation.

In this connection it is well to remember that the developmental scheme of the auditory apparatus is such that deformities of the external ear and meatus are usually associated with abnormalities of the antro-tympanic cavity and occur quite independently of the labyrinth, whose origin is distinct and separate. Given a rudimentary or deformed auricle, it is probable that there will be some degree of meatal occlusion. This may be simply a mere diaphragm or septum, or there may be complete absence. In either event abnormal mobility of the auricle will be found so much exaggerated that its attachments to the bony margin are sufficiently loose to enable one to ascertain the presence or absence of the underlying tympanic ring. Should the anulus be present and the Eustachian tube patent the existence of a useful middle ear apparatus is probable. By placing a stethoscope over the meatal region and at the same time inflating the Eustachian tube we can still further increase our knowledge of the essential integrity of the conducting apparatus.

Eustachian tube occlusion, occlusion of the posterior choanæ, and meatal obstruction may be diagnosed with a fair degree of accuracy as to situation and degree of severity. Other congenital defects do not lend themselves so readily to accurate solution. From a review of the literature of autopsies performed on deaf mutes, Politzer finds almost every conceivable form of anomaly. Among these are atresias of the canals, impaired development or absence of the middle ear, defects and rachitic deformities in the labyrinthine windows, bilateral osseous closure of the round windows, atrophy of the cochlear nerve and spiral ganglion in the first turn of the cochlea, lack of development of the labyrinth and auditory nerve, and malformation of the central nervous system.

A mere perusal of the list suffices to indicate the infinitude of causes which are to be considered in establishing the seat of the congenital defect, and when we add to this the theories of the new school of applied heredity and try to sift out the "unit characters" which make for or against the inheritance of tendencies to the various forms of catarrhal and nervous deaf-

ness, we find ourselves in a veritable maze of conflicting possibilities.

Briefly to recapitulate the foregoing statements, we conclude:

1. Congenital deafness is exceedingly common. Perhaps 55 per cent. of all chronic cases have in them some hereditary congenital element.
2. All forms of congenital deafness are exceedingly increased in their liability to recurrence in offspring by the intermarriage of parents having a deaf mute strain in the family.
3. It is highly probable that many forms of deafness hitherto regarded as originating *de novo* have in reality an hereditary taint.
4. The anatomical abnormalities of the auricle are frequently associated with congenital defects of the middle ear and external auditory canal.
5. These defects are often capable of exact diagnosis and are often of such a slight degree as to give considerable ground for a favorable prognosis following operation.
6. The congenital defects of the inner ear are more difficult of diagnosis and are not usually amenable to operative interference.

Having thus briefly outlined the salient features in congenital deafness, we will pass to the next caption, namely, traumatic causes of impaired hearing. Here, although we perhaps find less difficulties in diagnosis, at the same time other vexatious problems, especially those of a medico-legal nature, serve to complicate our subject and render its systematic presentation a question of difficulty.

Broadly speaking, we may classify injuries which produce deafness under the following heads:

1. Fractures of the skull involving the auditory centers.
2. Fractures of the temporal bone involving the labyrinth.
3. Traumatism of the membrana tympana, either direct, by penetrating wounds or extension of fracture of the skull, or indirect, by sudden change of air pressure in the external auditory canal or tympanum.
4. Concussion of the labyrinth.
5. Small constantly repeated injuries or insults to the auditory apparatus, as in certain occupations, such as boiler making, telephone switchboard work, etc.
6. Injuries to the Eustachian tube and its pharyngeal orifice.

Fractures of such severity as to cause interference with the auditory centers we shall dismiss with the statement that in such instances the local condition will probably be subservient to the gravity of the general injury, and will fall more properly under the realm of the aphasias, and is consequently beyond the scope of the present article. Fractures which cause interference with hearing on account of labyrinthine involve-

ment will probably be accompanied by an escape of cerebro spinal fluid from the ear through a tympanic membrane which has been ruptured simultaneously with the injury to the labyrinth. As in cases involving the auditory centers, the injury to the inner ear will probably be secondary in importance to the basal fracture. If recovery occurs, there will be profuse suppuration, proliferation of the inflamed membrana tympana and mucous membrane of the middle ear and adhesions of the remnants of the membrane to the inner tympanic wall.

Injury to the membrana tympana is the most common form of traumatism causing impairment of hearing. There are manifold ways in which this may occur. The most common is that due to the sudden condensation of air in the external auditory canal caused by blows on the ear, and by the entrance of water while diving. Other causes are picking the ears with various kinds of instruments, loud detonations of gun powder explosions, and even the careless use of the bougie passed through the Eustachian tube and recklessly allowed to impinge upon the inner surface of the drum membrane.

Whatever may be the cause of simple rupture of the drum, the lesion shows a tendency to spontaneous healing and as a rule leaves but few evil consequences behind it. Unless infection takes place, complete cicatrization usually occurs in from three to fifteen days, and the slight disturbance of hearing quickly passes away. When this persists it is indicative of coincident concussion of the labyrinth, and a consequent paralysis of the auditory nerve.

It is especially in connection with traumatic ruptures of the drum that medico-legal questions may arise. It may be contended by the defendant that the rupture existed before the receipt of the injury and was due to disease. In such an event it is well to remember that traumatic ruptures are usually large and single, and are generally situated midway between the manubrium and the tendinous ring. Only rarely does a perforation due to injury extend from the handle of the malleus to the extreme periphery. Likewise, Schrapnell's membrane is seldom involved in such injuries. Furthermore, Valsalva's experiment gives a characteristic sound. The air passes through with a broad, low-pitched breathing sound, and the high-pitched, squeaky noises perceived in cases of old perforations are practically never encountered. Besides, the air passes through a traumatic perforation easily, requiring but little pressure to make its exit into the auditory canal.

In regard to the concussion of the labyrinth, it is usually considered that the gravity is less when the membrane is ruptured. If the drum remains intact the whole force of the blow is directly transmitted to the labyrinth through the chain of ossicles, whereas in the case of rupture

a large part of the force of the blow is dissipated in producing the rupture itself.

The symptoms of concussion of the labyrinth vary according to the intensity of condensation of air or the loudness of the sound. In the slighter forms there is a moderate degree of deafness only. This is accompanied by a feeling of fullness in the ear and a subjective buzz. In the course of a few days these symptoms disappear. In the severe forms all the subjective symptoms are more marked and the deafness is greater. The impairment in hearing persists after the subjective noises disappear, and may in some cases be permanent. Sometimes it only affects the ability to perceive single tones or a group of tones, whereas in other cases it may result in total deafness for all sounds. As in cases of traumatic rupture of the membrana tympana, concussion of the labyrinth may give rise to medico-legal questions. Here the physician must be very careful in expressing an opinion. In reference to this phase of the question, Politzer says: "A medico-legal decision as to the existence of concussion of the labyrinth can be given only in those cases in which there is fissure of the temporal bone extending to the external meatus, and in which an injury of the labyrinth may be inferred, either from the discharge of cerebro spinal fluid or from complicating deafness and the absence of perception through the cranial bones. Those concussions of the internal ear produced either by direct violence to the head or detonation in which the external meatus and membrana tympana present a normal appearance, are absolutely incapable of being judged from a medico-legal standpoint, because (1) proof is lacking that the paralysis of the auditory nerve is due to the presumed injury, and (2) even if the traumatism has been established, it cannot be positively stated that the paralysis of the acoustic nerve had not existed before receiving the injury."

Concerning the action of small repeated insults or injuries to the auditory nerve apparatus inflicted on the patient by virtue of the peculiar nature of his occupation, we are not in a position to make many positive statements. Naturally these cases do not often come to autopsy and the changes that take place are not definitely known. Speaking generally, we believe that loud noise occupations, such as that of boiler makers, cause deafness by producing atrophy of the auditory nerve. In 1888, Blake, of Boston, called attention to the detrimental influence of the telephone switch board upon the hearing of the operator. Although there is no doubt but that the constant noise of the switchboard may act detrimentally, it is probable that the perfecting of the telephone apparatus, and the consequent lessening of the adventitious noises due to putting in and pulling out of the plugs in making connections, has gradually brought about

an amelioration of the conditions of twenty years ago.

The last important traumatic cause of deafness which we have to mention is injuries to the Eustachian tube and rhino pharynx. For these the physician himself is nearly always to blame. Unskillfully performed adenectomies may result in permanent damage to the orifice of the Eustachian tube, leaving cicatricial bands which interfere with its function, thus setting up a chronic inflammation which may result in more or less permanent injury to hearing. With the final warning that bougies may be inadvertently broken off and left in the tube, we will pass from this phase of our subject and draw our remarks to a close by a brief consideration of the toxic causes of deafness.

The exact way in which toxic agents cause deafness and tinnitus aurium varies in some degree with the nature of the drug causing the trouble. In a general way it can be said that quinine, salicylic acid and the coal tar products first exert their evil influence primarily upon the circulation of the inner ear. Tobacco and alcohol probably produce their bad effects by an indirect action, aggravating existing catarrhal conditions of the rhino pharynx and thus hastening the progress of the pathological changes already started in the Eustachian tube and middle ear. In this connection it is important to remember that in prescribing coal tar products, quinine and the salicylates, we should consider the aural history of the patient and have a care that we do not aggravate an already existing middle ear or labyrinthine trouble. Arsenic, lead, mercury, phosphorus and sulphur are all capable of producing chronic poisoning with accompanying local ear symptoms. But in this case the local ear symptoms will probably be subsidiary to the state of general constitutional debility. In other words, it will be a relatively unimportant feature in the general composite picture of chronic intoxication.

It has been found that rabbits, cats and guinea pigs to which quinine or salicylic acid has been administered in poisonous doses suffer a very great congestion of the internal ear and labyrinth. This undoubtedly throws light upon the cause of the tinnitus aurium and deafness induced by cinchonism, and leads us to the conclusion that the disorders of the special senses thus produced are due to the direct or indirect congestive action upon the peripheral sense organ.

It is not at all unusual for us to encounter patients who attribute their deafness to overdoses of quinine, and it is quite conceivable that the preliminary congestion caused by this drug may be followed by an ischmia of such chronicity and severity as to cause degeneration of the eighth nerve and consequently a permanent impairment of the hearing.

To recapitulate: Those toxic agents which may interfere with hearing are: lead, mercury,

arsenic, phosphorus, sulphur, analine chromatin, the synthetic coal tar products, the salicylates, alcohol, tobacco and quinine. Of these the most important are: 1st, alcohol and tobacco, which produce their chief effects *indirectly*, and 2nd, quinine, the salicylates and coal tar products, which exert their primary evil effects upon the circulation of the inner ear. Finally, the diagnosis of these cases is to be determined by the history of the use of the drug in question, together with the co-existence of constitutional and local symptoms which point to such use.

OTOSCLEROSIS AS A CAUSE OF DEAFNESS.*

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OF "deafness as a result of Otosclerosis," as the title given me reads, I know of but little to say except that it is rather more hopeless than is deafness due to most any other cause.

I have, however, taken the liberty to suppose that the intention of those giving out the titles was to have me say something of *Otosclerosis as a cause of deafness*. If this supposition be correct, of Otosclerosis there is a very little to say that is definite and positive, more that is negative, and a great deal that is problematical, in the sense of being still under discussion. Even the name, otosclerosis, is now-a-days receiving some very hard knocks, having been largely criticised and even condemned at the last meeting of the German Otological Society, and various substitutes therefor have been proposed.

When asked by our Secretary to prepare such a paper, my answer was that I knew but little about otosclerosis, but that I could look it up, and perhaps learn something that would be of interest to our section. Having gone over the literature, and I can truly say that I have done so quite extensively, I am frank to admit that I find I *know* even less than I *supposed* I did.

I know of but one positive statement that I can make concerning otosclerosis, without expecting to be contradicted, and that is, that there *is* a lesion of the temporal bone found at autopsy and by subsequent microscopic examination, which we may call otosclerosis, capsular labyrinthitis, osteitis, spongification, new-spongification, with or without exostosis or hyperostosis, osteomalacic capsular labyrinthitis, etc., etc. As to the existence of such a lesion there seems a general agreement.

The second statement that I wish to make is a positive one of a negative proposition, and of this much contradiction will not surprise me; this above-mentioned lesion cannot at the

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

present time be diagnosticated clinically—by this I mean the lesion of and by itself. If it chance to involve the oval window and stapes articulation, as it is very prone to do, clinically demonstrable symptoms are produced, but then our diagnosis becomes one of stapes rigidity, and not of otosclerosis: we may have rigidity of the stapes without otosclerosis—we may have otosclerosis without stapes rigidity.

Until recently my diagnosis of otosclerosis had been based upon functional tests showing trouble with the conducting apparatus, *i. e.*, the presence of the so-called Bezold triad of 1. elevation of the low-tone limit by air-conduction, 2. prolongation of bone-conduction beyond the normal for tuning fork A, and 3. negative Rinne, together with a normal, or virtually normal, tympanic membrane and Eustachian tube, and in doing so have supposed that I was in the goodly company of most of my colleagues. But recent reports of cases examined clinically and post-mortem by such men as Panse, Siebenmann, Bloch, and others would seem to have rendered such a position quite untenable. Permit me at this point just a few quotations.

Manasse declares, as a result of his microscopic findings, that "an interdependence of the described anatomical bone changes and the known clinical appearances appears not proven." Panse "joins heartily with this conclusion as a result of four clinically tested ears and the autopsy findings." Siebenmann has "established shortening of bone-conduction, and positive Rinne." Manasse again says "we meet with many cases of bone changes and nerve atrophy going together." Jörgen Möller found that "of 36 cases 23 showed bone-conduction decidedly shortened, and Rinne oftener positive than negative, and in 31 of the cases the upper-tone limit was lowered." Bloch says "Bezold's triad is present in only a small minority of cases. When the hyperostotic formation does not reach and fix the stapes a diagnosis is impossible. I believe we have a disease which begins in the nerve." These and other observations of similar import have left me in a position where I now follow a diagnosis of otosclerosis with two interrogation points, instead of with one, as has heretofore been my custom. Before leaving this question of diagnosis I might mention what Froeschel has introduced as a new symptom of otosclerosis, *viz.*, the sensibility of the walls of the external auditory canal, even to the inner end, is gradually lost *pari passu* with the increase of deafness. He concludes that this results from some external influence of the vagus and trigeminus. He found this symptom more or less marked in 24 out of 29 otosclerotics, in only 2 out of 20 suffering from other ear diseases.

Under the heading of *Etiology* of otosclero-

sis much has been propounded, but as yet nothing proven. Of heredity we have heard a great deal; our present status on this point has been perhaps best summed up by Dr. Gray, of Glasgow, in his paper read before the American Academy of Ophthalmology and Otolaryngology last September (published in the *Laryngoscope* for January, 1912) as follows:

"1. In the first place, it is clear that the relationship of hereditary influence to otosclerosis is much more complex than has been supposed, but at the same time, such relationship is very close. 2. It is quite futile to attempt to divide cases into those due to hereditary influence, and those not due to this cause. And, consequently, it is not only useless but actually misleading, to refer to a certain percentage of the cases as being inherited. Each aurist will hold a different opinion as to what constitutes evidence of inheritance, and such estimates, therefore, become merely statements of opinion. 3. In all cases, however clear the evidence of hereditary influence may be, local and constitutional conditions may play an important part in determining the onset and course of the disease. The attempt to attribute all cases of otosclerosis to inheritance from some more or less remote ancestor, who may have suffered from the disease, is, at present at least unjustified."

Of rheumatism and gout as causative factors, there appears to me but little to say except that they seem most unlikely.

Syphilis has had quite some standing as an etiological factor but is being given up by one and another owing to the usually negative history, and the absence of benefit from anti-syphilitic treatment, together with a demonstrated post-mortem difference of lesion in the two conditions. As to Ferreri's osteomalacia and rachitis as causes I am keeping an open, but as yet far from convinced, mind.

Cornet has written concerning the auto-toxemias, gastro-intestinal, hepatic, renal, etc., as being very probably causative in many cases.

Sohier Bryant says that he coincides with the many authors who have attributed trophic and toxic disturbances as etiological factors of otosclerosis, and believes that these trophic disturbances are due to altered internal secretion, chiefly of the thyroid gland. If by "trophic disturbances" is meant such as are caused by interference with the function of the trophic nerves (if there be such), the fact, as stated by the neurologists, that these conditions are *almost always unilateral* would seem to exclude them from any large part in the etiology of the subject under discussion. On the other hand the fact that otosclerosis is *almost always bilateral* leads us very definitely to seek for some general systemic condition,

and among these it would seem to me that the auto-toxic theory, whether based upon altered internal secretion, *e. g.*, of the thyroid or other glands, or upon insufficient elimination, *e. g.*, of gastro-intestinal products, is less open to objection than are any of the theories previously mentioned, or of the many others that I have not touched upon.

In introducing the question of *pathology* I wish to make two quotations relative thereto. The first from Sohler Bryant, as follows: "The fact is well established that the variable lesions of otosclerosis are exact counterparts of variable osteitic lesions occurring in other parts of the skeleton." The second from Bezold and Siebenmann, "We do not know of any analogy in the pathology of our system of bones for this chronic inflammatory, hyperplastic process, as we must call it on account of its anatomical peculiarities. We can hardly expect that the *pathogenesis* of this peculiar disease will ever be satisfactorily explained, so much more so, as its clinical and pathological picture has no analogy."

With two such radically opposite and positive statements from such well-known writers on otological subjects before me, what can I say? Nothing, except to feebly admit that my ignorance of this phase of the subject is so dense that I do not even dare to attempt to make any harmonizing suggestion. I can only leave the matter open until further research demonstrates that one or other or neither of these statements is correct.

In view of what I have said above, a very few words relative to my own experience with this class of cases will suffice.

In 1,000 consecutive records of recent private patients I found 36 cases in which I had made a diagnosis of otosclerosis (as I said above, followed by an interrogation point), a proportion of 3.6 per cent. of all ear cases. Of these 10 were males, 26 females; 7 were under 20 years of age; 16 between 20 and 30 years of age; 7 between 30 and 40 years of age; and 6 between 40 and 50 years of age.

The Bezold triad was noted in all the cases, because at that time I supposed its presence was essential for a diagnosis of otosclerosis. A positive note of Paracismus Willisii was made in 11 cases. In only 3 cases was I able to elicit a history of seemingly similar deafness in other members of the family. As bearing on the question of pregnancy and parturition having an etiological relation, 24 of the 36 cases were in males and unmarried females; of the remaining 12, married women, 3 at least are known to be childless, and only 2 of the total number thought they were worse during and after pregnancy (in each instance their first child).

In not one of the 36 cases was there the

slightest reason to even suspect the presence of syphilis or of being para-syphilitic. Three of the cases complained of having had occasional attacks which they characterized as either neuralgic or rheumatic.

Twelve of the cases had a virtually normal nose and nasopharynx. Several of the others had deviated septa and spurs, mostly in lesser degree, meaning thereby that nasal respiration was not interfered with. There was one case with suppurating anterior ethmoid cells; one with a synechia between the inferior turbinate and septum; one with a perforation of septum, apparently traumatic. It is perhaps worthy of mention that about 50 per cent. of the cases had when I saw them, or had evidently previously had, a lymphoid mass in the naso-pharynx, of variable size, mostly small rather than large. I doubt, however, if we can in any degree attribute to this any causative relation to the otosclerosis, my reason for saying this being that they had evidently not caused any prolonged interference with the ventilation of the tympanic cavity, as evidenced by the normal appearance and position of the tympanic membranes.

This short paper, whose intent, I must admit, has been rather destructive than constructive, I would sum up as follows:

1. There is a diseased condition of the temporal bone, found at autopsy and by microscopic investigation, to which various names have been ascribed, but which has oftenest been called otosclerosis. Would I appear too skeptical if I suggested the possibility that there may be many temporal bones which are the seat of this condition but which are passed by without investigation because of an absence of clinical symptoms?

2. We do not yet know whether this lesion originates in the middle or in the internal ear.

3. This disease, so far as our present knowledge of it goes, attacks more frequently, but by no means always, the labyrinthine windows.

4. When the windows are involved demonstrable clinical symptoms result, but,

5. An interdependence of the described anatomical bone changes and the known clinical evidences seems not proven.

6. If this be true, then a diagnosis of otosclerosis in its essence cannot at present be made.

7. I do not believe the name, otosclerosis, a good one, nor the one that will finally prevail, to describe the lesion under discussion.

8. We do not yet know the etiology of this condition.

9. We do not yet know all that is required about its pathology. Hence 10. No treatment has as yet been proposed which is at all satisfying.

TINNITUS AURIUM — ITS SIGNIFICANCE IN CERTAIN DISEASES OF THE EAR.*

By EDMUND PRINCE FOWLER, M.D.,

NEW YORK CITY.

SUPPURATIVE inflammations of the auditory apparatus, like those of other organs and tissues, usually announce their presence by sensations of pain. Non-suppurative inflammations, on the contrary, seldom cause pain, but give rise to various sensations, determined especially by the reactions peculiar to the nervous elements in the parts affected and varying also according to the degree these are irritated or paralyzed.

If the eighth nerve is irritated or paralyzed, subjective noises or deafness regularly occur, and to a degree commensurate with the severity or location of the lesions.

In a series of two thousand cases, I found ear noises present in about two-thirds of all diseases of the ear, and in non-suppurative cases over 75 per cent. gave a history of tinnitus. Such a large percentage of cases having one symptom in common is of great significance and it will now no more do to put this down as tinnitus, and flatter ourselves that we have really noted something of importance thereby, than it would to put down pain or fever and think that our inquiry should go no further than the mere notation of these symptoms.

In the case of pain we almost automatically set to work to orient ourselves as to its exact location, its variations, course and severity, and its behavior under many manipulative and static diagnostic procedures. In the case of tinnitus, I regret to say that inquiry is only too often superficial, and deals usually with but a few facts as to severity, duration and the kind of noise experienced.

Of course, the symptom being almost always subjective and many patients being unable to accurately observe or describe their sensations with scientific precision, a great difficulty at once presents itself in investigations concerning tinnitus, but our modern refinements of diagnosis have all come from small and very crude beginnings, and so it will be with tinnitus. In order to make any progress, continued and definite efforts must be made to unearth its mysteries, although at first we find nothing, it may be, but our ignorance. To discover one's ignorance is a real step in advance, paradoxical as this may seem.

Although I realize that in many cases of ear disease with tinnitus, it is impossible with our present knowledge to elicit much of value, yet in a majority of cases phenomena of vital import may be discovered, and I desire to strongly emphasize this fact.

To my mind, the wonderful thing about tinnitus is not its presence, but its apparent absence in any case. How is it possible that an organ, sensitive as is the ear to the most minute stimuli, can avoid bringing to the consciousness the sounds engendered within and about its own substance? Sounds engendered not only by the rush of the currents of blood and lymph, but by the ever varying tensions of the bones, ligaments and muscles in and about the ear, and by the cerebral, arterial, venous and respiratory pulses. Engendered by these, and also by extraneous sounds, and by the coincidences and interferences of similar and dissimilar wave lengths reaching it from all sides without, and from many millions of points within its own confines. It is beyond human power to conceive an organ of hearing so acoustically perfect that only sounds from without can reach the receptive apparatus, and this perfection is not necessary for practical audition, for in every ear there is constantly present a tinnitus, not recognized it may be, or by some not possible of recognition, but present nevertheless. I have elsewhere gone into this subject at length, and cannot take the space to further elaborate it at this time.

In the abnormal or diseased ear the approach to perfection is less perfect, and consequently vibrations may become subjectively apparent which in healthier states were prevented from reaching the receptive end organs in sufficient strength to be noted. Moreover, these undulations of sound by, as it were, better training the ear for their perception, create a vicious cycle and thus continually, up to a certain point, perpetuate themselves.

For the purpose of study, I divide the subjective sensations of hearing into two great classes: 1st, those resulting from an increase of, or a susceptibility to, normally present irritations; 2nd, those resulting from added irritations. In many instances the cause of the irritations may, by furnishing better conduction towards the receptive mechanism, or by increasing the resonance of the middle ear or external auditory meatus, cause tinnitus by both classes of irritations, and it is a fact that most cases of tinnitus result from a combination of the two classes, one or the other predominating.

Tinnitus is seldom uniform in character, being dependent upon the situation, extent, severity, rapidity, remittance and the chronicity of the irritations, caused by or superimposed upon different anatomical, physiological or pathological states, and all these with the external influences may vary from time to time.

Defects of hearing are usually accompanied by well defined tinnitus, but nature has so lavishly provided us with auditory power that for the easy recognition of sounds usually noticed but a small part of normal hearing is necessary.

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

It is for this reason, because of the lesser diseased ears relative perfection, and the non-appreciation of the significance of tinnitus, that progressive deafness is not noticed, or not troublesome earlier in its course. Especially in that largest class of cases, namely the so-called middle ear catarrhs, do the conditions just mentioned generally prevail, and to the great disadvantage of the patient.

As I have shown, about 75 per cent. of catarrhal cases suffer from tinnitus, and most of these have had repeated warnings, which should have been heeded before the defective hearing was truly squared away upon its chronic course. The repeated recurrence of tinnitus is a positive sign that tenacious irritative lesions exist, and it is the duty of the otologist to determine whence these emanate, and the probable physical or biochemical basis of their being.

Such an apparently benign affection as impacted cerumen may cause tinnitus, not only by irritating the drum membrane by its pressure or traction thereon, but by increasing the resonance of the external auditory canal, shutting out extraneous sounds, and by the direct conduction of entotic sounds to the drum membrane or neighboring structures. The *modus operandi* of tinnitus due to impacted cerumen may be very prettily demonstrated by using a sensitive receiver and a microphone telephone transmitter, and placing between the diaphragm and the distal circumference of the mouthpiece of the latter threads of cerumen. The threads of wax, if of the right consistency and if properly adjusted, will cause vibrations of the transmitter diaphragm, and especially if they are made to rapidly take up moisture. This may be accomplished by mixing with the wax small threads or fibres of absorbent cotton, or other like material, and adding thereto a drop of moisture. The change in the amount of moisture content explains one cause of the variations in the sensations experienced by I. C. patients. Unless the cerumen is under a changing stress, it appears to cause no sound; at least, the artificial tinnitus elicited in my experiments disappears soon after the cerumen was applied, and I could make it reappear only by changing its tension by manipulative procedures or by the addition of moisture. In the human ear it is possible that this does not always follow, as the drum membrane may be irritated by the foreign body, irrespective of changing stress.

Coiling several turns of the smallest rubber tubing against or near to a telephone transmitter diaphragm, and forcing through it fluids of various kinds, and at various velocities and pressures, will demonstrate in a crude manner the possible effects of various and varied blood and

other currents near the ear. Especially startling is the effect of a suitably adjusted constriction in the tubing. By these means I have evolved sounds resembling very closely many ear noises. If the resonance of the transmitter is increased, increased also is the experimental tinnitus.

If both ends of a tube are closed, its resonance may be altered, and it follows that if the Eustachian tube and the external auditory meatus are both closed, the resonance of the middle ear and its adjacent intercommunicating cavities may be altered. In certain cases, tinnitus may be increased or diminished by manipulative procedures along these lines. In my opinion, the shutting off or obliteration of the mastoid antrum or cells results in a diminution of resonance, and therefore in a lessening of many entotic sounds. This may account for the lessening or lack of tinnitus sometimes noted after inflammatory or sclerosing lesions in the mastoid bone.

Middle ear tinnitus of long standing will occasionally diminish or cease, although it is apparent that no improvement in the hearing has occurred, and that the lesions in the middle ear cavities are, if anything, greater in extent and in severity than they had previously been. In these cases it is conceivable that the increase of the blockage in the conducting and resonator apparatus has reached such a point that it may not only have markedly diminished the hearing power by air conduction, but that it may also have diminished the resonance of the middle ear to such an extent that this is an important factor in the lessening of the tinnitus.

The foregoing observations and arguments apply to cases of tinnitus of middle ear and external ear origin. True intralabyrinthine irritations are not perceptibly influenced by changes in the conduction or resonator apparatus, and indeed, this is one very significant fact, and it may be utilized as a diagnostic aid.

The functional tests at present in vogue are so unsatisfactory, except for marked nerve deafness and lesions of the conduction apparatus, that little practical information can be gleaned through their use. A day rarely passes that I am not puzzled regarding the diagnosis of some case, which, according to the usual tests, gave quite clear-cut reactions, and yet upon further inquiry these reactions may in reality be found altogether misleading.

I give to you the idea of more accurately investigating the tinnitides, to the end that by their department under various conditions, an insight may be obtained not only as to the etiology of the noises, but as to the lesions, causative of both the noises and other auditory phenomena.

I earnestly urge the education of both physicians and the laity as to the import of recurrent

defects of audition, and as to the significance of tinnitus aureum.

Heed the warning when from within comes the "still small voice."

Discussion.

DR. W. SOHIER BRYANT, New York City: Dr. Fowler's estimate of the prevalence of tinnitus seems to me to be too low. I estimate it as occurring in above 95 per cent. of all cases of ear disease.

Dr. Fowler's explanation of tinnitus on the basis of the size of the aural resonating chamber and the size of the vibrating blood vessels, depending as it does on increased nerve irritability or increased irritation, is very ingenious and valuable. This basis will surely help the interpretation of the tinnitus symptoms in many cases. The etiology of tinnitus is important, since the discomfort and distress from tinnitus aggregate more, I believe, than from any other disagreeable ear symptoms, not excepting pain and deafness. The torture from tinnitus is so extreme that it ruins patients' lives, and not infrequently leads to insanity. We have as yet no certain clue in some cases of tinnitus, but in objective tinnitus we can determine the underlying cause, with or without a stethoscope. We also know that intermittent tinnitus is due to muscular action, and that rhythmic tinnitus, synchronous with the pulse, is due to the vibration of the arteries. Low-pitched tinnitus we know is due to a venous hum or to disturbances of the middle ear. High-pitched, very loud, variable tinnitus, musical and articulate tinnitus are usually connected with nerve or central irritation. Tinnitus is normal in absolute stillness, such as at the top of a mountain peak, or deep in the earth. These are circulatory tinnitus.

DR. STEPHEN H. LUTZ, Brooklyn: How far afield we must go at times to find a cause for tinnitus is well demonstrated by a case which I saw some four years ago. The patient was a woman, thirty-five years of age. She had had tinnitus for eight years, beginning soon after her only child was born. The tinnitus increased as the years went on; sometimes she was worse than at others. She was very anæmic, and frequently ill enough to be in bed. Iron, arsenic and various other tonics had done her no good. It was only by persistent questioning, very reluctantly answered, that I found a reason. She had been having an almost constant bloody uterine discharge with periodic floodings from the time of her confinement eight years before. I sent her to a gynæcologist, who curetted and later removed the uterus. She gradually recovered from the anæmia when the loss of blood was stopped and her tinnitus disappeared, not to return again.

The use of the blood pressure apparatus as a routine part of the examination in ear cases may

help us in tinnitus cases. It is of great value in determining one of the causes of tinnitus.

Dr. Fowler, in closing the discussion, said:

"In testing the labyrinths by the rotation tests I have found several cases of otosclerosis, all of which showed marked diminution in the after nystagmus or a total lack of nystagmus unless the rate of the rotations was increased.

"This is interesting as having a possible explanation in the otosclerotic process."

DR. GEORGE F. COTT, Buffalo: The question of tinnitus aurium, its etiology and pathology, may never be definitely settled, because it is always a symptom only and its degree depends partly upon the lesion producing it and partly upon the mental state of the patient. Tinnitus is produced by such a variety of conditions that its treatment, unless the etiology is known, is entirely expectant and sometimes successful. When the cause can be ascertained and is not due to organic changes then we can commonly remedy the defect. The most troublesome cases are those occurring in so-called neurotic patients. If here the mind can be controlled, the improvement is marked. The tinnitus due to ossicular adhesions, cicatrices, foreign bodies, etc., yield quite readily to treatment, but most satisfactory results I have obtained in cases due to fatigue from various causes. One patient who was suffering for forty years with exasperating tinnitus was entirely relieved by cold baths.

NASAL OBSTRUCTION AND THE VALUE OF SUBMUCOUS RESECTION OF THE NASAL SEPTUM FOR ITS RELIEF.*

By JAMES F. McCAW, M.D.,
WATERTOWN.

AT the outset I wish to state that the observations here recorded are based upon the writer's personal experience and clinical observation covering the last eight years, which is the time covered by my work on submucous resection of the nasal septum, for the relief of nasal obstruction, and includes about one hundred and ninety-five operated cases.

Nasal obstruction, within the limits of this paper, means any permanent impairment to free nasal respiration, and may vary from very slight stenosis to complete obstruction of one or both nostrils. In cases of this character, it is of the utmost importance to determine the underlying cause of such impediment and whether the symptoms in any given case are dependent upon the impaired respiration, or whether there may not be some localized pathological process involving the organ complained of. This can only be accomplished by a very careful and thorough examination, of not only the nasal chambers and their accessory cavities, but also includes the

* Read before the Fifth District Branch of the Medical Society of the State of New York, at Oswego, N. Y., October 3, 1912.

naso-pharynx, pharynx, larynx and ears. One who makes only a cursory examination of his cases and gives his patient a nasal douche when he presents himself with the self-made diagnosis of "catarrh," which means anything from a slight hypertrophic rhinitis to the most destructive suppuration of the nasal sinuses and even malignant growths, makes a grave mistake. The sooner the profession remedies this error and treat such cases based upon an accurate diagnosis, I am sure that the better results obtained will more than compensate for the time consumed in a detailed and careful examination. I mention this advisedly, with the hope that some good may come of it.

A frequently recorded observation is that the symptoms are not always commensurate with the apparent degree of stenosis. In other words, we frequently see cases which disclose, upon examination, evidences of very marked obstruction to nasal breathing and still the patient complains very little of this particular symptom, but comes for relief, it may be, of one or more of the many conditions which are directly or indirectly dependent upon such deficiency of nasal breathing or drainage. On the other hand, there are many cases who come to us giving a history of pronounced nasal obstruction and many reflex neuroses, dependent upon intranasal deformities, and upon examination we are astonished to find such slight deviations or deflections giving rise to such pronounced symptoms. What are some of the local and systemic conditions dependent upon perversion of the nasal function?

These patients complain of their inability to breathe freely through the nose, this being most noticeable or worse at night. The stenosis is often alternating, as the opposite nostril is affected by sympathy, even though not structurally defective, and mouth breathing is resorted to, in consequence of which, cold, dust-laden air is taken directly into the larynx and lungs. This carried on indefinitely, brings about structural changes in the delicate mucous membrane lining these organs, from the constant irritation of the inspired foreign matter and lowered temperature of the atmosphere, which should be filtered and properly warmed in its passage through the nose in normal nasal breathing.

It is not difficult to understand that under such circumstances pathological processes involving the entire upper respiratory tract, may take place. Clinical experience bears out this statement, and we find following in the train of nasal obstruction and forced mouth breathing, chronic naso-pharyngitis, pharyngitis, laryngitis with persistent dry or hacking cough, with scanty expectoration, great accumulation over night of large quantities of thick tenaceous mucus to be hawked and cleared away in the mornings. This is usually spoken of as "chronic catarrh," a term, however, which should be eliminated

from our literature, as it means nothing and is used only to cover up our ignorance of the exact conditions present. Many of these cases have intermittent attacks of vaso-motor rhinitis with almost complete obstruction of both nostrils; others complain that the nose feels full most of the time, with frequent and annoying paroxysms of sneezing, these attacks coming on at certain seasons of the year are spoken of as "hay fever; rose cold, etc." Another reflex condition which may, and often is, dependent upon irregularities and obstruction within the nasal chambers, is asthma. The writer has seen many such cases yield kindly to the proper intranasal treatment. We do not wish to be misunderstood, for we are aware there are many other forms of asthma, but there are a sufficient number dependent upon nasal stenosis to warrant us in examining all cases for this possible cause. These symptoms of reflex neuroses are usually present in young adults of nervous temperament, in whose nasal chambers you will find, besides the partial arrest of the air current through the nose, intermittent or continuous pressure on one or more of the turbinate bodies. This is especially true of the middle turbinate. Headaches are often present and usually a prominent symptom in sinus involvement. Frequent colds starting in the nose should make us suspicious of nasal obstruction; a dry throat, especially in the morning, is a prominent symptom of such obstruction. Impaired vocal function with husky and easily fatigued voice, sighing respiration, frequent yawning, sometimes insomnia, are common symptoms. These symptoms are dependent upon air hunger and due to improper breathing. The general health and resisting power of these patients are below normal, as sufficient and properly prepared air is just as important to our bodies as food, and the organism suffers in proportion to the impairment of the normal supply. Where the obstructing lesion extends well posteriorly there may occur interference with the normal function of the eustachian tube and indirectly with the middle ear, producing tubal stenosis, or one of the acute or chronic catarrhal or suppurative inflammations of the middle ear. If the obstruction is very great and involves both nostrils, there is produced a certain degree of suction upon the eustachian tubes during each act of deglutition and the baneful influence upon the ear can be readily appreciated. In the time at my disposal it will be impossible for me to do more than mention that nearly all cases of purulent inflammation of the accessory sinuses of the nose, with polypoid degeneration of the mucous membrane and subsequent bony necrosis with its dangers of extension to the orbit or brain cavity, is due primarily to interference with drainage from the sinuses, dependent upon some intra-nasal irregularity. Suffice it to say that these extreme cases not

only undermine the general health of the individual, but are a menace to his life. Enough, I think, has been said to show that proper nasal respiration plays a very important part in the metabolism of the body; that being the case, we should put forth our best efforts to establish free nasal breathing wherever obstructive lesions are found.

What part does deflection of the nasal septum play in producing nasal obstruction? Without taking up the discussion of the conditions found in childhood which produce mouth breathing, and limiting what I have to say to adult life, it is the writer's firm belief, based upon many years of observation and clinical experience, that deflection of the nasal septum is the fundamental underlying cause of perhaps seventy-five per cent. of all cases of impairment to nasal respiration. When from some cause, a slight deflection of the nasal septum occurs, the corresponding nostril is narrowed to the exact degree of the deviation, thus drainage and normal breathing is interfered with to the same degree. The compensatory function of all organs is well known, and nowhere in the body is it better demonstrated than in the nose. It is a frequently recorded observation that nature soon begins a compensatory hypertrophy of the turbinate bodies corresponding to the concave side of the septal deflection; such condition carried a little farther, produces marked interference with sinus drainage, and sooner or later there is added to the symptom of nasal obstruction, all the other symptoms for which it is directly or indirectly responsible. The value of submucous resection of the nasal septum for the relief of such conditions, has now passed the experimental stage and has given the writer the best results of any operative procedure within the nasal chambers. It brings about more nearly an equal breathing space for each nostril, relieves the pressure of the deflection on the turbinates and the passive congestion and turgescence of their mucous membrane; thus finally improving nasal drainage and ventilation of the accessory sinuses. The benefits derived from such a change are not far to see. We have seen boggy, turgescient turbinates gradually shrink and take on a healthy condition, many, many times following this procedure. My failures with it have been few, so that I have come to look upon it with the greatest confidence in the relief of nasal obstruction. Some of my best results have been in patients with only slight deviations, but very pronounced symptoms; the relief has been most marked and beneficial. I have also seen the same beneficial results in cases of vaso-motor rhinitis with asthmatic attacks. There is no case of deflection of the nasal septum that the submucous operation is not suited to, and has long since superseded the old cutting and crushing, operations with their failures and barbarous after treatment.

True hyperplasia or bulging of the turbinates,

polypoid degeneration or suppurative sinusitis, would have to be dealt with appropriately later, but deflection of the septum must have first attention. My method of procedure is to do all cases at the hospital under strict antiseptic precautions, and use a local anaesthetic; I have only done three cases under general anaesthesia. I use as an anaesthetic 8 per cent. cocaine in 1-2000 adrenalin. Small pledgets of cotton saturated in this solution, are packed against the septum in both nostrils and allowed to remain ten minutes. During this time the patient is given morphine sulph. gr. $\frac{1}{8}$ in one dram of aromatic spirits of ammonia. This acts both as a cerebral sedative and cardiac stimulant. I have used this medication for years, and rarely have I seen a patient who will not go through the operation without the slightest difficulty. A curved incision is made just in front of the deflection through the mucous membrane and perichondrium, extending from the floor to below the bridge. The next step is to start the elevation of the perichondrium with the sharp end of the elevator, then proceed with the dull end until the mucoperichondrial flap is hanging free from the roof to the floor of the nose. An incision is now made through the cartilage to the membrane in the opposite nostril and the elevation of perichondrium and periosteum accomplished in the same manner as described above. Having the flaps perfectly free on both sides over the deflection, the cartilage is removed with a Balmenger knife; the remaining cartilage and bony portion is now removed with a bone-cutting forcep. That part of the perpendicular plate of the ethmoid between the middle turbinates is seized with a thin-blade grasping forcep and broken away. The deflected part of the maxillary ridge is next attacked and removed with the Hurd down-cutting forceps, which is the best instrument I have found for this work. After assuring myself that the flaps hang in the median line, packing is put in each nostril and the patient put to bed for twenty-four hours, at the end of which time the packing is removed and the patient discharged from the hospital.

Of the many variations in the technique to meet varying degrees and forms of deflections I will be unable to speak, but suffice it to say they are many, and at times tax the ingenuity and operative skill of the surgeon.

In conclusion, nasal obstruction and its consequent symptoms are due primarily to deviations or deflections of the nasal septum in about 75 per cent. of all cases.

Submucous resection of the nasal septum is the operative procedure best suited to the relief of such condition, and the value of it is shown in the permanent patency of the nasal chambers, the ultimate reduction of the boggy and turgescient mucous membranes of the turbinate bodies, and the improved drainage and ventilation of the nasal accessory sinuses.

THE SUBMUCOUS OPERATION AND SOME OF ITS DIFFICULTIES.*

By ISAAC M. HELLER, M.D.,

NEW YORK CITY.

ONE feels almost like apologizing for reading a paper on a subject whose merits and indications are so well recognized and upon which so much has been said and written. But in spite of this, there are some steps in the *modus operandi* which seem to be giving considerable difficulty, for scarcely a month passes without witnessing some new instrument or suggestion whereby some portion may be simplified. In general, it may be considered almost axiomatic, that the more new instruments invented for an operation, the more unsettled is its status. The writer admits he has tripped over many a stumbling block while doing the classical submucous and regrets being compelled to confess to more than one perforation. It was this which led him to seek the cause of his difficulties and how to overcome them. His present method, practiced for some little time, has met with sufficient success to warrant a justification for this paper.

As to the indications, preparation and anaesthesia little will be said. Firstly, they do not come within the scope of this paper, and secondly, they have been so well laid down as to permit of little discussion. One fact, however, is worthy of mention. Beware of operating in the presence of an *acute* inflammation of the nasal, pharyngeal or aural tracts. Firstly, on account of the acute congestion it is difficult to obtain the desired bloodless field, and secondly, a number of serious results have followed the operation. Oppenheimer, at a recent meeting of the N. Y. Academy of Medicine, reported a case of general septicemia with serious complications and almost loss of life following a submucous operation done (by another) while the patient had a three-day-old acute otitis media. Quinlan reported a similar experience and Hays mentions two serious cases, with one death,¹ indicating that the submucous has its mortality not to be ignored as has any other surgical procedure. By way of contrast, chronic inflammations, as old sinusitis, offer no contraindications and in fact, it may be necessary to relieve obstruction in order to satisfactorily approach the desired parts for treatment. Before proceeding further, I want to state it is my practice to operate on the patient's left, regardless of the side of the convexity. Those who are really ambidextrous may choose the convex side with little or no advantage. The others, like myself, will find no difficulty in continuing to work on the left, for the septum is flexible enough, as Ballinger has pointed out,² to allow its being pushed over even

if markedly concave with the operator's finger on the right nostril. In the procedure as later outlined this is even more simply carried out because the anterior end of the cartilage is incised early, thereby freeing this attachment.

Our very first difficulty lies at the threshold of the operation, the primary incision. Upon the manner of making it depends directly the ease and success of the entire subsequent procedure. The knife should be held with its cutting edge exactly at right angles to the septum at that point and not at a more or less acute angle, such as one holds a pen in writing, and for the following reasons. What we term the mucous membrane is not a simple sheet of extreme thinness but a fairly thick layer made up of an outer epithelium, an inner perichondrium or periostium and a mesial connective tissue or submucosa. Between outer and middle layers there is no line of cleavage, but between the submucosa and perichondrium is a fairly well defined one. An elevator slipped just external to the perichondrium can readily be pushed far backwards. This means leaving more or less perichondrium attached to the cartilage, a thin flap and positive laceration, to say nothing of the annoying hemorrhage. It may be urged that the whiteness of the cartilage renders this error unlikely, but if epinephrin has been freely used, it is often impossible to differentiate in color between the two tissues in question. In making the incision at an angle, we expose a beveled and long instead of a straight and short surface, rendering the chances of slipping into the submucosa frequent. (See Figure 1.) When, at the same time, the incision is extended through the cartilage, the sharp edge of the perichondrium stands out in bold relief. This may seem a small point to dwell upon, but in actual practice its importance can be appreciated by anyone trying both methods. It means, too, at the end of the operation we have a cleancut, square edge to replace instead of one frayed or frazzled. In all the articles on the subject I have not seen this fact brought out.

INCISION. There are really but two incisions thus far proposed, the Freer and the Killian. The others are modifications of one of these and differ in degree rather than kind. The Freer is an inverted "L" shaped incision, with the angle pointing posteriorly. Its author justly claims it offers a better exposure than the Killian when at work in the depths of the nose. For the few times I have used it, the following objections seemed valid. Firstly, it is difficult to perform satisfactorily when compelled to work down close to the floor of the nose. Secondly, it requires a trained assistant to retract the flaps, else the angular one will be constantly in the way and subject to laceration. Thirdly, and most important of all, there is bound to be a certain amount of retraction of this angular flap, pre-

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.



Fig 1. a, Perichondrium
b, Cartilage
c mucosa & submucosa.

cluding its accurate adjustment into its former position at the close of the operation. In consequence, a more or less denuded area is left to heal by granulation. Freer³ himself states that scabbing lasts from 4 to 12 weeks. I have found, however, that the exposure is excellent and has in this respect a decided advantage over the Killian where one must at times work in a dark pocket. I have no doubt that in the skilled hands of Dr. Freer, with his able assistants, this method accomplishes all he claims for it.

The Killian incision or any of its modifications has been the one of almost universal choice. It has never been satisfactory to me because of the small working space afforded. This means a constant stretching of the raised flap with speculum or retractor, besides comparative darkness when working in deep. (Figure 6.) We must remember that ours is essentially a plastic oper-

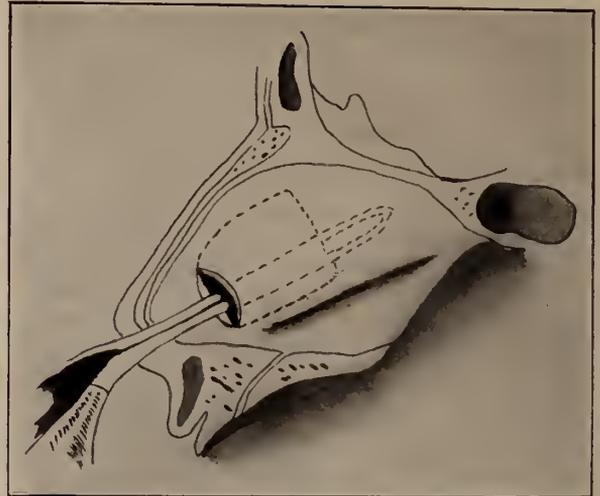


FIG. 6.—Ballenger.

ation and as in all such we should be careful neither to sacrifice nor lacerate any of the soft parts necessary to perfect healing by first intention. With these facts in mind, I felt that a decided extension of the Killian incision might profitably be made. Accordingly, I start above as does Killian or Hajek, but instead of stopping

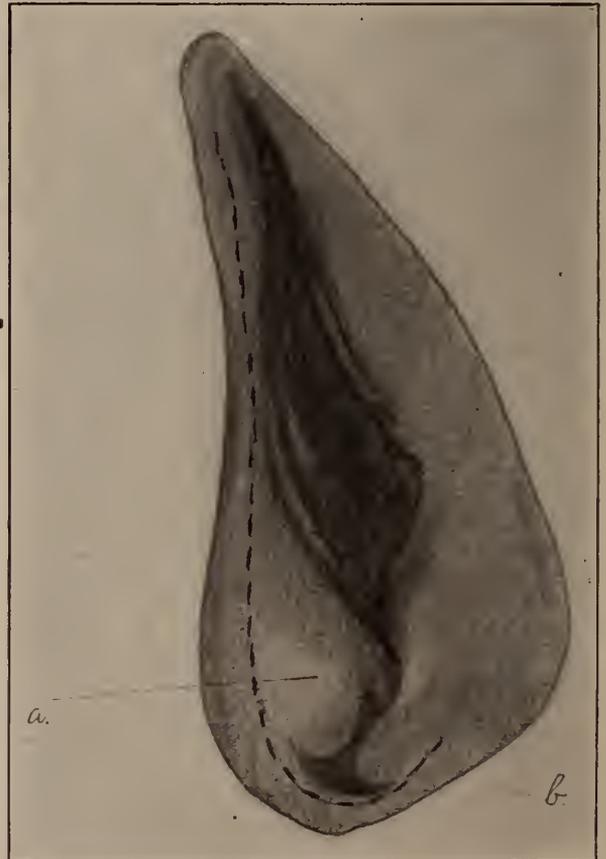


FIG. 2.—(a) Deviation; (b) incision.

at the floor of the nose, continue same across this to the outer side almost to the level of the inferior turbinate, similar to Yankauer's method.⁷ (Figure 2.) While doing this, however, with a finger in the right nostril, I cut deep enough to penetrate the cartilage and feel the knife just under the mucous membrane covering the finger. After leaving the cartilage the knife is pressed down to the bone of the maxillary spine, nasal floor and outer wall respectively, incising the periosteum thereof. This cutting the cartilage synchronously with the incision tends to overcome the liability of perforation in the second stage while going through the cartilage to denude the other side. I explain this by the added resistance of the superimposed mucous membrane and the physical fact that all material cuts less readily across its fibers than in a slanting direction. In the original Killian method, the septum is thinner by $\frac{1}{2}$ mm. and by cutting on a slant, as Pynchon⁴ advises, one may perforate the opposite side before he realizes it. It should be mentioned that one should never use a pointed knife for this purpose, but a curved edge blade like that of Freer. The point of a knife on the downward stroke is apt to cut deeper than the shank and defeat our purpose. It has been suggested by one writer to enter the cartilage a few millimeters posterior to the first incision in order to bring the two at different levels. With the above method, this is unnecessary and with anterior deviations it is often inadvisable or impossible to spare these extra millimeters of cartilage. Müller⁵ was the first, as far as I am able to learn, to advocate cutting the cartilage with the initial incision. McWhinnie⁸ two years later emphasized its value, but I had used it on some ten cases before reading either of their articles.

After making sure that the cartilage is incised through and through, the finger in the right nostril pushes the septum to the left, exposing the squarely-cut cartilage and its overlying perichondrium. A sharp or semi-sharp elevator is now readily inserted under the perichondrium, guided by sight and not sense of touch. Beginning at the upper pole, the elevator is pushed upwards and backwards to the bony septum, then downwards to the floor, using the side rather than the point of the instrument, as advised by Ballinger. As a rule, when the instrument once enters correctly, there is no difficulty in this step. Occasionally, if there happen to be a sharp vertical deflection, one may penetrate the mucous membrane trying to get around it. Keeping well up to the dorsum of the nose until one feels the elevator touching bone before coming down tends to obviate this difficulty, since the side of the instrument is less apt to cause perforation than the point.

Working our way downwards and forwards, we lift the mucous membrane from the quadrangular cartilage until we come to a sudden halt at

the crest of the vomer. Here is the stumbling block par excellence of the operation and presents more difficulties than all the other steps put together. Many an otherwise excellent operation has been spoiled right here, and with good reason. Ballinger, quoting Neuman, shows that where bone joins bone the periosteum is one unbroken sheet, but where bone joins cartilage periosteum and perichondrium are not continuous. In this region the periosteum rises from the floor of the nose and passes upward over the lateral surface of the vomer to its crest. It is reflected over this, then passes downward, covering the

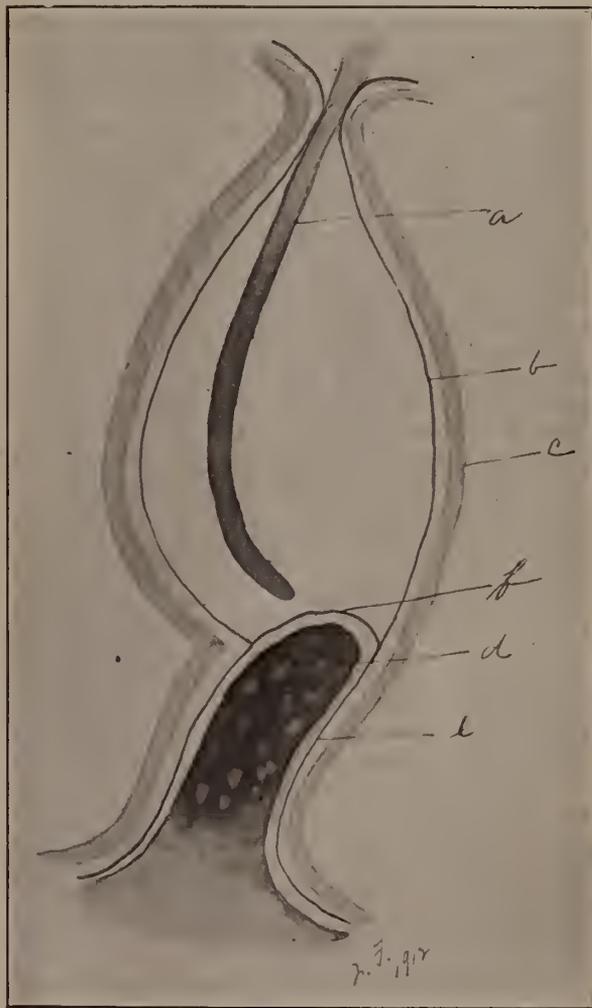


FIG. 3. (Ballinger).—(a) Cartilage; (b) perichondrium; (c) mucous and sub-mucous coats; (d) bone; (e) coalesced perichondrium and periosteum; (f) periosteum deflected over crest to other side.

opposite lateral surface of the vomer to the floor of the nose again. (Figure 3.) The perichondrium, too, covers the lateral surfaces of the vomer external and densely adherent to the periosteum. Our descending elevator, therefore, strikes the "V" shaped pocket formed by the two

tissues, between which there is no line of cleavage. Any undue force in trying to separate these layers must result in a laceration. Katz, quoted by Müller,⁵ thinks it rarely possible to save the mucous membrane below the crest because it is so near the floor of the nose and sacrifices it whenever necessary. Some operators chisel the crest loose and then separate it from the soft parts. This appeals to me as dangerous as it is crude. One can scarcely avoid laceration, since the tissues are still strongly attached below. Besides, after the crista is detached from the vomer, one has yet to separate it from the mucous membrane. Ballenger advises an incision of the periosteum along the crest and then slipping an elevator in this incision, lifting the tissues from the bone. Theoretically this is excellent, but practically it, too, has its difficulties. Firstly, one must make that incision in the dark, not on a flat surface, but along a wavy ridgepole as it were. To take Ballenger's own illustration, for example, one can readily see that cutting downward along an edge the merest slip would buttonhole the flap. Secondly, should one succeed in making the incision correctly, one has to find it again with an elevator always working on an overhanging edge in a downward direction. While I have successfully accomplished this in a number of cases, in others, where the horizontal angle was markedly acute, I found it impossible to avoid laceration in spite of painstaking care and time. However, this ridge must be removed at all events, since no operation for deviated septum is worthy of the name which leaves it standing. If the deflection be great, the symptoms will not be relieved, and where it is small its removal allows greater working space and freedom. Appreciating all this from my own experience and observing the work of others, both here and abroad, it occurred to me that if the mountain would not go to Mohamed, Mohamed must trot mountainwards. Or, more specifically, if we cannot free the crest from above, why not try it from below?

It is understood now that the soft parts anteriorly stand free from the dorsum above to the crest of the vomer below, and posteriorly from the cribriform plate to the floor of the nose (approximately). The only remaining adherent portion is at the vomer and maxillary spine where they join the quadrangular cartilage. Going back to the original incision, I stated it should be extended across the floor of the nose to the outer wall and through the periosteum to the bone. A rounded, sharp or semi-sharp elevator is now inserted at the center of the floor under the periosteum and pushed downwards and backwards. By hugging the bone one will find as ready a line of cleavage here as at the upper part of the septum. While working back 7-9 cm. and rocking the instrument from side to side, the tissues are lifted from the floor and external wall to well under the crest. Where the crista is low or hook-shaped, considerable force and care must

be exercised while manipulating in a curved narrow space. If sufficient cocaine and epinephrin have been used, there is no pain beyond an unpleasant sensation in the incisors and the hemorrhage is negligible. I use for this purpose an elevator having a semi-sharp, bilateral cutting edge 5 cm. long, with a rounded point.

The end of the instrument is now well behind the cartilaginous portion of the crest and by a little raising it soon finds its way into the opening made from above at the bony spem. Working forwards, we come again to the crest and it is apparent that the only line of attachment is a thin strip of tissue at the very summit. This strip may be safely cut, as Ballenger suggests,

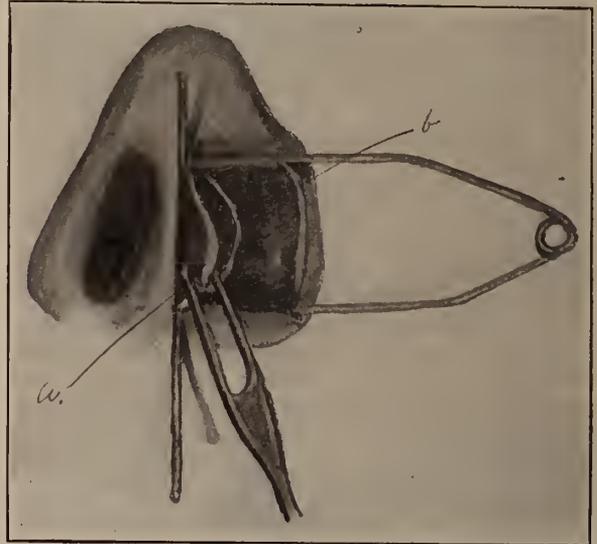


FIG. 4 (Ballenger).—(a) and (b) as in Fig. 5.

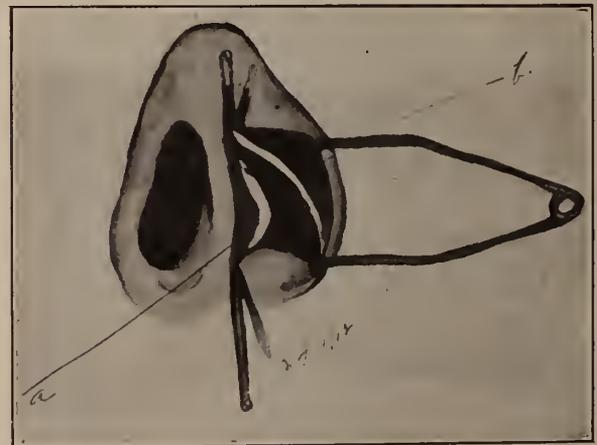


FIG. 5.—(a) Cartilage; (b) curtain made up of perichondrium sub-mucosa and mucosa. Note lower attachment of latter.

for the tissues below are now free, or, as I prefer, to cut it with a curved knife from behind forwards, except the extreme anterior tip, which is attacked from the front. We have now, not a dangling nor a tight buttonhole flap, but a

free curtain of mucous membrane extending from the dorsum above to the floor below at its junction with the outer wall. (Figures 4 and 5.) It can be retracted with any form of speculum as widely as the nostril itself without fear of injury, since its attachments are practically coincident. It offers wide and deep inspection of the wound and if one has reached this point without perforating the curtain he may breathe relieved with the knowledge that, no matter what may happen to the other side, he has at least one intact sheet to replace which will prevent all perforation. Besides, the working space is so ample and the curtain so loose that nothing short of unpardonable clumsiness will lacerate it from now on.

The next step offers nothing new and, as a rule, little difficulty. Through the already made incision and under the guidance of the eye, the periosteotome is slipped under the mucous membrane and this lifted from cartilage and bone as before, stopping at the crest again. No attempt is made to free this now. Some form of bivalve retractor is inserted on either side of the septum and the cartilage removed with the Ballenger swivel or other knife. Freer's criticism that one cuts too close to the dorsum with the swivel knife, with probable sinking thereof, is not well founded. With a reasonable amount of care a sufficiently broad strip of cartilage can be left standing to support the nose.

After removing the chondrium the perpendicular plate of the ethmoid is attacked with the Ballenger, Jansen-Middleton or other forceps, going back far enough to insure eradicating all deflected bone. Metzenbaum⁶ and others advise the use of the chisel for this purpose. This instrument cannot be as well guided as the forceps and the bone is usually so thin as to allow of its removal without any great force. In using the forceps, however, one must bite the bone rather than twist it off, as fractures of the ethmoidal plate extending up to and involving the cribriform have been reported.

It will be noted that we have taken away all the cartilage and bone desired except the crest, and that the tissues are adherent to it on the second side. A Freer's sharp, curved periosteotome is inserted at the bony septum, where the mucous membrane is free, and brought forward, carefully hugging the bone and peeling the tissues as we go. There is a possibility of laceration in this procedure, but what of it, so long as we have our first unbroken curtain to lay up against it? It might be urged, why not use this method in separating the mucous membrane in the first instance? This is not possible, even if advisable, since the presence of the cartilage takes up the needed space required for manipulating the instrument.

With the crest free from all its soft parts, there remains only its removal. Most operators prefer to chisel this off, which to me has some

serious objections. Firstly, in spite of every precaution there is always the possibility of its slipping and lacerating the flaps, which up to this time may have been in perfect condition. Secondly, and more commonly, it is decidedly disagreeable to the patient. It must be realized that by this time we have been working from one-half hour to one hour on one who, no matter now patient he may have been, is fast losing his stock thereof; who has more or less headache from the handling or the medication, and whose upper teeth feel as though pried apart with wooden plugs. To submit a person in this condition to a process which can only appeal to him as being hit on the head with a mallet borders on cruelty. A biting forceps, cutting downward, of the Lutz pattern accomplishes all we can expect of a chisel with equal rapidity and with none of these objections. Moreover, one can control the amount of bone removed with greater accuracy.*

Inspecting the wound, removing all particles of loose tissue and bloodclots, carefully examining the nose with the flap in situ to determine if sufficient breathing space has rewarded our efforts, completes the operation for many. Others believe in suturing the flap. Abroad the Killian needle is largely used, as did I for a while. I soon gave it up, because I found the instrument clumsy and prone to lacerate the flap edges by pulling through on its insertion. Then I tried leaving the parts unsutured, but found crusting took place in the gap, which lasted a few weeks and proved annoying. This was just in the vestibule where the patient could pick at it and the temptation to do so was often irresistible. Lately, I have sutured again, but now use an ordinary small, full-curved Hagedorn needle and silk, with a small holder such as used in eye work. One stitch is enough and as easily placed as on the skin. The advantages are union by first intention, limiting secondary infection and minimizing hemorrhage. Besides, there is no danger of displacing the flap on introducing the packing for which we are now ready.

Freer strongly advocates narrow strips with powdered bismuth, while others use the Bernay's splints smeared with Beck's bismuth paste No. 1. The former can be more accurately packed, while the latter by its swelling properties is the better hemostat. All packing should be removed in 24 to 36 hours and where necessary fresh material inserted. Where the mucous membrane has not been lacerated, the bleeding after the first removal is negligible. The sutures can be taken out on the second or third day. By using silk there is no irritation, as might result from the stiffer silk-worm or catgut. Following the removal of the packing, it is my cus-

NOTE.—Since writing the above, the author has met with two cases where the maxillary crest was so hard that he was compelled to resort to the chisel. He therefore admits in some conditions the forceps may prove insufficient.

tom to order Sharp & Dohme's nazeptic wool to be placed in each vestibule at half-hourly intervals. This is a fine cotton impregnated with a weak alcoholic solution of menthol, phenol, methyl, salicylate and eucalyptol. It gives a pleasant cooling sensation to the mucous membrane, which always swells by reaction. Moreover, the patients believe there is something in the nose to avoid catching cold and to keep out the dirt. It absorbs the secretion, and being pink, does not attract the attention of the ordinary white cotton.

Before concluding I want to say a word of those who claim to do this operation in 8 to 15 minutes, as does MacWhinnie in the *Laryngoscope* of December, 1911: I have done and witnessed this performed many times by admittedly able operators both here and abroad, and my conclusions as to ease and required time differ from theirs decidedly. It may be that these rapid operators have been particularly fortunate in having a run of very easy cases, but one is constrained to believe that perhaps every bit of obstruction, especially along the crest, has not been removed. My cases take from one-half to one hour, and where the patient is nervous or faints occasionally, even longer. Such men as Müller, Fein, Katz, Hirsch, Horn and Gerber abroad, and Freer, Ballenger, Andrews, Yankauer, Purcell and others in this country make no pretense of hurrying through in "bogey" time. Freer, in his excellent monograph, takes the definite stand that one should never sacrifice ultimate results for time.

CONCLUSIONS: 1. The submucous resection of the septum is an essentially plastic operation, where the integrity of the soft parts should be preserved to the fullest extent.

2. We are not justified in attempting to remove a large quantity of bone and cartilage through a buttonhole incision nor work in the depths of a dark pocket. Such procedure increases the difficulties unnecessarily.

3. No operation is complete which does not remove all the obstruction, be it bone or cartilage, from floor to roof of the nose and from the anterior maxillary spine to free edge of the vomer if need be.

4. The difficulties can all be overcome by patient dissection and most readily along the lines of natural cleavage.

5. It is not a "quick and easy" operation when properly performed and should never be attempted unless one has sufficient time at his disposal.

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Discussion.

DR. LEWIS A. COFFIN, New York: Dr. Heller has pointed the way around the most difficult parts of a submucous resection and I am sure those who follow his carefully described technic will do a good operation.

His method of separating the membranes from the bone below the top of the crest I have done many times. As to the danger of perforating the flap in trying to lift the membranes from the cartilage or bone at the apex of the deviation and in trying to raise the membranes beyond this apex I would say that the danger is lessened to the diminishing point if previously the cartilage or bone is removed as far back as the apex. That beyond is then easily reached. I think one often errs in trying to remove too large a piece at once. It makes no difference in how many pieces we remove the cartilage or bone as long as we remove enough.

The Ballinger knife figures less and less in my submucous work. I feel that sometimes we pay too much attention to the ridge, the good of the patient demanding greater care and more thorough work in the upper or middle turbinal region of the septum. Like Dr. Heller, I find that many of my cases demand from an hour to an hour and a half of hard and trying work.

DR. STEPHEN H. LUTZ, Brooklyn: The wide elevation of the first flap is the secret of the success of the future steps in this operation. The upper portion of the septum between the middle turbinates must be removed if there is the slightest deviation at this point. The use of my ridge forceps is easily followed and controlled by the eye if the flaps are widely elevated. A saw can be used to good effect many times to make the horizontal leg of an "L" incision, but it must be as far down on the floor as possible. This saw cut must be at right angles to the septum until the saw cuts almost through, when it is turned so that the cut is directed upward. This is not easy to do, but it can be of great help in shortening the operation.

THE SURGICAL MANAGEMENT OF NASAL ACCESSORY SINUS DISEASE.*

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NEW YORK CITY.

MR. PRESIDENT AND GENTLEMEN:

IN opening the discussion on this broad subject the limitations of time compel me to confine myself to the discussion of general principles, as well as to the expression of my personal experience and conclusions.

Disease of the accessory sinuses may be classified as follows:

According to type, the disease may be catarrhal, empyemic or malignant.

According to stage, acute or chronic. (*Note.*—There may be an acute exacerbation of a chronic process, and, of course, an acute case may become chronic.)

According to objective signs, the disease may be active or latent.

According to location, the disease is named from the sinus involved.

In this connection should be mentioned the mucocele as a diseased condition sufficiently peculiar to be in a class by itself.

What I shall have to say in this paper on the surgical management of accessory sinus disease has reference solely to the empyemic form of sinusitis in its various manifestations.

I have used the term "active sinusitis" in contradistinction to "latent," although I feel that neither is a good term, for I consider that by "latent" sinusitis is meant not so much a dormant disease of one or more of the sinuses, as a disease which presents no objective signs. It might be termed an "occult" sinusitis. Such a disease may exist in the sinuses of persons whose noses present a practically normal appearance.

It may involve any of the sinuses, and is of the utmost interest and importance because of the difficulty of diagnosis. It is, for the most part, a chronic process. When involving the frontal or antral cavities transillumination and the radiograph materially aid in the diagnosis, but existing independently in the ethmoids or sphenoids or confined to those two cavities, the diagnosis must rest upon symptoms and possibly the study of the eye. In a suspected latent sinusitis, other causes which might account for the symptoms must be excluded. The suspicions confirmed and diagnosis made, one proceeds as in ordinary or active sinusitis of the involved cavity, except that no temporizing with washings and applications should be done. The diseased cavity must be opened and the disease eradicated.

I have dwelt somewhat at length upon this subject because I feel that many such cases are unrecognized, and the rhinologist should be on the lookout and alert to relieve a greater number

of people who suffer from obscure or latent sinusitis.

An active sinusitis might be called "an apparent or evident" sinusitis. It is easily diagnosed as such, the difficulty being to decide as to which or how many sinuses are involved.

Just what surgery shall be done on a particular case depends largely upon the stage of the disease, on the structural deformity of the nose, and especially upon the condition of the membrane lining the sinus, which may depend upon the variety of infection or the constitutional vice of the patient.

The condition of the membrane lining an infected sinus varies from a simple, round-cell infiltration to granulation thickening on to poly-poid degeneration, which condition, continuing, may end in devitalizing of the membrane and bone necrosis. Probably in some constitutional conditions, notably syphilitic, the trouble may begin in the bone, in which case the disease of the membrane is secondary.

Whereas there is undoubtedly a great difference in the degree of the pathological changes which take place in the diseased lining membrane of the accessory sinuses of different individuals, as well as in the time in which the changes occur, it may be said, on general principles, that the changes are greater in the same length of time than take place in almost any other part of the body. This is due to the peculiar structure of the normal membrane. A certain number of fulminating cases develop so rapidly as to fall almost at once into the emergency class. Such cases present evidence of great pressure, on account of which one sees danger to the eye or brain. A thorough operation should be done at once, under general anaesthesia, and through an external opening, if the frontal is involved. If the disease be confined to the ethmo-sphenoidal group, the attack may be made through the nose, under local anaesthesia. Such a case was brought to me from the eye department of the Manhattan Eye, Ear and Throat Hospital on March 11, 1912. A man, 45 years of age, laborer, had come to the eye clinic about one week earlier on account of a swollen left upper eyelid and lowered vision. He suffered no pain, complained of no nasal discharge, and the oculist felt that he had some kind of a tumor in his orbit; but conditions grew so rapidly worse that it occurred to him that there must be an acute process somewhere, and he asked me to examine the man as to the condition of his sinuses. The whole left side of the head was swollen and edematous to below the prominence of the malar bone. The upper lid could not be raised sufficiently to see any part of the eye. His nose was clean with the exception of the smallest bead of pus at the top of the middle meatus. When this was wiped away, no more appeared. The man could not be transilluminated. A radiograph showed cloudy, but

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

we thought the edema of the external parts might account, at least to some extent, for that. My willingness to open his frontal was based largely on the above picture, in connection with his statement that about six weeks before he had suffered for several days from an intense frontal headache. There was no history of syphilis, and a Wassermann test was negative. His frontal was filled with granulation tissue, and his ethmo-sphenoidal tract filled with a polypoid membrane. Each cell seemed to yield up individually its contents, which looked like the pulp of a grape expressed from its covering; there was no pus, nor was there pus in his orbit. A Caldwell-Luc operation was done on his antrum, the lining of which had likewise undergone the same polypoid degeneration. A complete and rapid convalescence was established.

I have related the above history because it shows with what rapidity this complete metamorphosis may take place. The absence of pus is interesting, and lends to instructive reflection on some of our cases of latent sinusitis.

The majority of acute cases tend to recover of themselves, but this tendency may be enhanced by proper treatment, which is pretty much summed up in the establishment of free drainage. Symptoms may be relieved and a cure hastened by washing out the diseased cavities with some of the simple aseptic washes. Drainage of the frontal sinus and anterior ethmoid is generally sufficiently established by the removal of the anterior third of the middle turbinal. Much and speedy relief is frequently afforded by applying suction to the diseased sinus. This is a procedure of great use also, in differential diagnosis. It may be necessary to straighten the septum, which is crowding the middle turbinal against the body of the ethmoid. Such a case was that of Mr. S. H., aged 37 years, who presented himself at my office on January 6, 1912. He was suffering intense pain in the left frontal region, left frontal very tender on pressure and palpation, and dark on transillumination. A large quantity of pus was draining off through the throat. The left nostril was completely occluded at the vestibule by a deviated septum, which deviation was seen by examining the right side to extend well back. I sent him into the hospital and temporized with inhalations and heat for three days, debating whether I should do a Killian operation and a submucous resection of the septum at the same time. I decided to do an ordinary resection of the septum, and await developments. This I did on January 10th. My incision was made on the left or diseased side, the cartilage was removed so that the flaps hung straight. I did not pack. The turbinal was pried toward the median line and not removed. Fearing sepsis, the nose was frequently douched from the right side. I never knew a resection of the septum to do better, nor a frontal sinusitis to clear up more promptly. He left the hospital on Janu-

ary 15th, five days after the operation, and resumed work about ten days later.

To show the difference in handling an emergency case, I will give one other history. An Italian, about 35 years of age, came to the eye clinic of the Manhattan Eye, Ear and Throat Hospital about one week later than the previous case. His left eye was exophthalmosed and closed, lids purple, vision so lowered that he could count fingers but about eighteen inches from the eye; had the same occluding deviation as the former case, but it did not seem to extend so far backward. He was placed at once on the operating table, the knuckle of cartilage obstructing nostril was removed by knife and saw, making a large opening through the septum, and a radical Killian was done on frontal ethmoids and sphenoid. A Caldwell-Luc operation was done at the same time on the antrum. Recovery was complete and uneventful. Vision became normal as soon as the swelling about the orbit had subsided.

Most of the mooted questions as to the method of operation on the accessory sinuses concern the treatment of the chronic cases, especially those involving the frontal, and giving histories of more or less acute exacerbations, not reaching such a state as to be considered emergency cases.

Any one of the sinuses may be independently diseased or they may be associately diseased in almost any of the possible combinations. Any of the sinuses may be reached by either intranasal or extranasal routes. Were it possible to explore and eradicate the disease of any sinus as thoroughly by the intranasal as by the extranasal route, or did the establishment of drainage ensure a cure of the disease, there would be no extranasal surgery for the cure of accessory sinus disease. One who has much to do with the treatment of these diseased cavities knows, however, that frequently the establishment of thorough drainage will not cure the disease, and certain of the sinuses can never be explored ocularly or thoroughly by instruments through the nose. On the other hand, well established drainage often does lead to a complete cure of a diseased sinus, and some of the sinuses in which it would not may be thoroughly explored and the disease eradicated through the nose; therefore, we have, of necessity, two operative procedures, namely, intranasal and the extranasal.

Now, again, it may be said, were it not that any scarring and any deformity which results from an extranasal attack on the accessory sinuses are on the face, there would be much less of intranasal work. The extranasal operation is done under a general anæsthesia. Every operated area is within easy view, so that diseased areas are more easily made out and eradicated, and, to the writer's mind, with as little or less danger than accompanies radical intranasal sur-

gery. But scarring and deformity of the face are great drawbacks, and both patient and surgeon are loath to have such results, if cure can be effected in any other way.

There is no doubt a greater ability at present to operate the various sinuses intranasally than a few years ago, and consequently, I believe, fewer extranasal operations are done. But many cases present as attested by the titles of the two succeeding papers on this programme, in which nothing short of a most radical operation through an external opening will produce a cure.

In doing an extranasal operation for the cure of a frontal sinusitis, one makes the same incision as is made if the ethmoids and sphenoids are also to be exenterated, and therefore, if the frontal is to be operated externally, the ethmoids and sphenoids, if diseased, should be operated at the same time, saving thus much time and pain to the patient. It often happens, however, that one feels that all can be accomplished intranasally, in which case the ethmoids and sphenoids are cleared up, and drainage from the frontal improved before it is found that, to effect a cure, the frontal must be opened externally.

On account of the bridge left by the Killian operation, the deformity is much less than by any other equally as radical procedure. The Killian operation has therefore, I believe, become the operation of choice by most operators.

We often hear of a modified Killian having been done. In a majority of cases, this refers to the leaving the anterior wall of the frontal intact. While not decrying this procedure in suitable cases, the writer believes that the majority of those cases that can be cured in this way could have been cured by intranasal work. Watson-Williams has recommended this as the safer and more surgical method for establishing drainage from the frontal in acute cases. In those cases of frontal sinusitis in which the lining membrane has become much degenerated and polypoid, the anterior wall should be removed and every nook and corner thoroughly curetted out. In the case of frontals so small that they do not extend above the upper border of the ordinary bridge, the anterior wall should be preserved.

It sometimes happens that the surgeon, having done what he considers a thorough Killian operation, has inadvertently failed to find some accessory cavity or offshoot from the frontal.

Such a case, when the membranes are thoroughly diseased and chronic, seldom recovers until a secondary operation is done, at which time the overlooked focus of disease is generally more easily found by tracing the pus to its source.

These cases, to my mind, prove conclusively the uselessness of talking of curing all cases by

the establishment of drainage. Certainly, it does not do it in the antrum, ethmoid nor sphenoid. Some operators (and Killian advises it), when there is much pus, especially if it has flowed over the cut surface, leave the wound but partially closed for two or three days and complete the suturing of the flaps after the reaction has subsided. To this there can be no objection. Personally, I close the wound at once. The operated cavities are not packed. The soft parts over the frontal area are pressed against the posterior wall of the frontal by a compress, held in place by a head bandage for about twelve hours. When the bandage is removed the compress is now held in position by adhesive strips, and two or three thicknesses of gauze, saturated with Burrows' solution, are laid over the wound. Stitches are removed in from 48 to 72 hours. The wet dressing is continued for three or four days and the compress is kept in position until the soft parts have become adherent to the posterior wall. Should the dura be exposed, the wound should be left open until granulation is well established. In cases where because of excessive hemorrhage from the bone or for other reasons, it seems advisable to pack the operated field, I leave the wound open in order to have a better control of affairs at time of removing packing and dressing.

In independent disease of the ethmoids or sphenoids, or in their associated disease, a practically radical operation may generally be done intranasally. There are various methods of opening and exenterating these cells.

Ballinger's ethmoidal knives, right and left, are constructed to cut upward and forward from the anterior face of the sphenoid encompassing the body of the ethmoid. In a thoroughly diseased condition of the ethmoid, with considerable bone necrosis, this is an expeditious and fairly easy procedure, not, however, unattended with danger, and in my hands, unless the parts be in the diseased condition just described, it is very painful.

Doctor R. C. Myles, in order to solve the question of safety, has invented a set of centripetally cutting chisels. They are safe, but on account of being necessarily small, compel one to use a great deal of time—a matter of much importance to the patient, if not to the surgeon. My own preference is to begin the exenteration of the ethmoids by the use of a Luc's forceps. One blade of the forceps can generally be pushed into the ethmoid body, the other being free in the middle or superior meatus. Closing the blades and rotating the forceps allows one to remove large masses, and but few bites are necessary in order to open up the entire middle and posterior portions of the ethmoid tract. The middle turbinate may be included in the grasp of the forceps, but unless much diseased, it is better to remove it previous to attacking the cells of the ethmoid body. If I wish to begin anterior

to the bulla, I generally open that cell by means of a chisel, which I push or tap into the cell and then by using the chisel as a lever, break down the wall of the bulla, thus making an opening through which one blade of the Luc's forceps may be made to enter the ethmoid body. The cells anterior to this and those cells higher up, or extending outward in such a way that they cannot be opened with the Luc's forceps, must be broken down by a small curette or some of the small angular cutting forceps. In a certain number of cases, some of the ethmoid cells may extend well over the orbit. These cells cannot be entered through the nose. They can be cleaned out only through an external opening. The ethmoid tract having been opened up by any of these methods, the sphenoid is easily entered, and if necessary, its opening may be easily enlarged by curette, burr or biting forceps. The time consumed for thus opening the ethmoid and sphenoid cavities is very short, with, as a rule, very little hemorrhage. The pain is considerable, but quickly over.

The antrum, whether diseased independently or in company with other of the sinuses, presents an independent surgical problem. Acutely diseased, it tends of itself to recovery. A considerable relief from pain and acceleration of cure is accomplished by first washing it out a few times, either through the natural opening or through a puncture in either the inferior or middle meatus.

Chronic empyema of the antrum may recover from washing if kept up for a considerable time. This is easily done if a fairly large opening is made in the inferior meatus through the nas-antral wall, which allows the patient himself to make more frequent washings than can be done in the surgeon's office, and through this opening applications, such as some of the silver or zinc salts, can be made.

If the disease has progressed to the extent that the lining membrane is covered with granulations or has become polypoid, a Caldwell-Luc operation should be done, and the diseased lining membrane thoroughly removed. The entrance into the nose should be made sufficiently large to ensure permanency.

MODERN SURGERY OF THE TONSIL.*

By T. H. HALSTED, M.D.,
SYRACUSE.

IN discussing this subject, by the term tonsil will be understood the faucial tonsil, and it is with the surgery of this body that we have to deal.

The portions of the tonsil which, becoming diseased, call for surgical interference are the lymphoid tissue and the crypts. The most essen-

tial parts to be considered when operating are the capsule and the plica supratonsillar and triangularis, and their relation to the pillars and palatine arch, together with the blood supply.

During early childhood all lymphoid tissue, including that of the tonsil, shows a tendency to great increase in growth and size—hyperplasia—and because of this excessive growth, which in itself may not be necessarily pathologic, requiring removal, yet may cause the tonsils to become so large that by their size and position they produce serious mechanical interference with other important functions or organs, such as with those of respiration, deglutition, speech or audition. The lymphoid tissue in the tonsil may also become the seat of actual disease, such as tubercular or pyogenic infection, and may call for surgical relief. The most frequent site of disease, however, is in the crypts and their epithelial cells. Secretion, which is constantly taking place, empties into them, and absorption from them into the interior of the tonsil may occur both through the normal and diseased lining. Good drainage is essential if they are to remain normal.

There is no reason to suppose, from anatomical structure, physiological investigation or clinical experience, that the function of the tonsil differs in any way from that of the rest of the lymphoid tissue. Even should physiologists prove that lymphoid tissue does possess the function of producing an internal secretion, we know that in removing the tonsils because of disease we are only removing a pathologic part of the whole of the lymphoid tissue and no harm is done to this function, as there remains plenty of tissue to continue this work. There is but one thyroid gland, one pancreas,—and dire results follow the complete removal of these organs. Good results ensue when a partial removal only of these diseased organs takes place, some of the organ being left to carry on the function.

Surgical interference is indicated because of both local and constitutional disease. Simple hypertrophy of the tonsil, if it produces neither local nor systemic disease, may be left alone; but if because of its enlargement there is mechanical interference with nasal respiration, or with deglutition, or causes impairment of hearing, or with speech, even though there be no history of tonsillitis, or of systemic disease, the tonsil should be removed. Patients frequently consult us because of a bad breath, and on examination it is discovered that the cause lies in the accumulation in the crypts of cheesy, ill-smelling concretions composed of decomposing epithelial cells, possibly food debris, and reeking with bacteria. The patient complains only of bad breath, sometimes cough, not always attacks of sore throat; the tonsils are removed to relieve the bad breath, and to the patient's surprise, there is almost immediately a gain in general health, the more or less sallow complexion

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 16, 1912.

becomes clear, and a considerable gain in weight follows. This is a case in which there is apparently but a local disease of the crypts, but one in which a systemic effect unsuspected either by the patient or her physician has existed, and the removal of the local difficulty relieves the patient of the systemic results of the disease.

Cervical adenitis, enlarged cervical glands, while not necessarily the effect of diseased faucial tonsils, are usually dependent for their infections upon tonsils, either grossly diseased or subject to recurrent inflammations, or, again, the tonsil, superficially normal, yet because of some of its crypts being obstructed and diseased, affords easy passage of pathogenic organisms, the tubercle bacillus, the strepto coccus or other organisms, to the cervical glands. The infection may gain access through other lymphoid tissue of Waldeyer's ring, or, again, diseased teeth and gums may be the portals of entrance. At the same time, cervical adenitis, whether tubercular or pyogenic, should call for the closest scrutiny of the tonsil, and it will be found that in the majority of cases it is the gateway through which infection has reached the glands. Unless glandular suppuration has actually taken place, it is as a rule safe to remove the tonsils first, postponing the removal of the glands until it is seen that tonsil removal is not sufficient. When enlarged cervical glands, especially in a child, are to be removed because of tubercular or other infection, the tonsils, if at all diseased, should also be removed, as one means of preventing further involvement of other glands.

It is now conceded that the tubercle bacillus may, and often does, in an incredibly short time pass through either a normal or tubercular tonsil to the glands, without showing any definite evidence in the tonsil of localized tubercular invasion or disease. There are no pathognomonic signs that would lead to a diagnosis of a tubercular tonsil in the majority of cases, unless it be the presence of accompanying tubercular glands in the neck. Superficial infiltration and ulceration due to the tubercle bacillus, such as we see in the pharynx or larynx, is exceedingly rare. Yet tuberculosis of the tonsil is quite common, though its diagnosis, prior to operation, is unusual. All tonsils removed at the Syracuse Women's & Children's Hospital are now subjected to microscopic examination. Of the last 297 patients operated on, it was found that 3.5 per cent. were tubercular, although the gross appearance in nearly every case did not differ from the other simple hypertrophied or enlarged tonsils.

This conforms to the statistics of most other observers, being under, rather than above, the average. It can be stated with reasonable certainty that four to five per cent. of all tonsils showing enlargement or disease are tubercular, that such tonsils are a menace to the further and

deeper inroads of tuberculosis to the glands, the lungs, the joints, or other organs of the body.

Acute articular rheumatism and infectious arthritis are known clinically to follow very commonly acute tonsillitis, the tonsils acting as portals for the entrance of the infection, which, carried through the blood and lymph streams, produce what is commonly called acute articular rheumatism. Not only do acute affections of the joints and serous membranes follow an acute inflammation of the tonsil, but so-called chronic rheumatism is closely related to chronic tonsillar inflammation, repeated small doses of the infection being fed into the blood from the tonsil. Before the causal relationship between diseased tonsils and rheumatism was appreciated, it was believed that one of the causes of peritonsillar abscess—quinsy—was "the rheumatic diathesis." A more rational explanation is that the diseased tonsil causes both the localized quinsy and the systemic infection, rheumatism so-called. Of course, other tonsillar tissue of "Waldeyer's ring" may be the focus and the entering way for the pyogenic organisms, causing rheumatism, and it may be necessary to remove the adenoid or the diseased lingual tonsil before shutting off other avenues of infection. It is not contended that the tonsil or the tonsillar tissue are the only points through which the infection producing rheumatism or arthritis enters the system, but it is contended that this is one of the very usual avenues for infection.

Acute endocarditis, nephritis and phlebitis have very often as their beginning an acute tonsillitis, and this latter need not be, and very often is not, severe. There is good clinical reason to believe that the infection, whatever it is, that produces chorea, gains an entrance through the tonsils. Certain it is that the removal of adenoids and tonsils usually improve the condition, if it does not entirely cure the patient having chorea. Without doubt many other infections showing themselves in remote organs and tissues originate through entrance of the infective organisms by way of the tonsil. That the constant swallowing of the cheesy and bacterial concretions that form in the tonsil crypts is a cause of chronic gastritis is apparently proven by the improved gastric condition following tonsillectomy. There are many other indications for the removal of the tonsils than the foregoing, such as Vincent's angina (after, not during, an attack), the presence of the leptothrix buccalis, producing pharyngo-mycosis, and, of course, recurrent attacks of acute tonsillitis and peritonsillar abscess.

A normal tonsil is one of nature's several barriers, the outpost, against the invasion of infective and pyogenic organisms, and a tonsil should not be removed without a definite reason and indication. It is often difficult in a given case to say with certainty whether a tonsil is diseased and should be removed. Size is not the determining factor, a comparatively large tonsil, pro-

jecting freely beyond the pillars, being often entirely harmless unless it causes some mechanical interference with other organs. The tonsil which, apart from mechanical effects, causes most trouble, especially systemic disturbances and infections in remote organs, is that one which to the superficial observer seems very small and insignificant, the so-called submerged or buried tonsil, which may be very large or comparatively small, but because of its being buried the drainage of its crypts is interfered with, its secretions, which decompose, are retained, and they harbor all kinds of bacteria. Because of their disease they offer an open door through which may enter into the deeper part of the tonsil, and from there into the cervical glands, the various kinds of bacteria which find lodgment in the tonsil. The diseased tonsil, instead of being a barrier, facilitates invasion of the adjacent glands, and the remoter parts of the body. It is wise to remove this portal of entrance and seal it up hermetically, as is done when the tonsil with its capsule is completely removed.

It is not often that a single crypt alone is blocked, but where such is the case, and a localized abscess has developed, the slitting up of the crypt and the application of the galvano-cautery to its interior to obliterate it may be sufficient, but when many crypts are diseased such treatment is usually ineffective. This is particularly so when the disease is in the upper lobe. There are times when the removal of this lobe in its entirety may be sufficient, especially in adults, the remainder of the tonsil being left. In the case of hemophiliacs good surgery would demand the gradual obliteration of the tonsil by the repeated applications of the galvano-cautery rather than by a cutting operation.

Tonsillotomy is as old as surgery itself, and accidental tonsillectomy has been performed since tonsillotomy was first practised. The tonsillotome and the snare have removed thousands of tonsils with the capsule intact when only a partial removal was intended, and without serious result. The objection to tonsillotomy is that it removes only a part of the diseased gland, and *that* the least objectionable portion; the remainder, the stump, becoming submerged, adherent to the pillars, and later on causing more mischief than did the original whole tonsil.

The objections to complete tonsillectomy were fear of serious hemorrhage, and the natural objection to removing an organ whose entire purpose in the economy was not fully understood. Time and experience have shown that when tonsillectomy is perfectly and cleanly performed, leaving no tags or remnants, hemorrhage is as a rule less than when only a part of the organ is excised, and the control of the hemorrhage is easier. The second objection is giving way to the experience gained by the observation of hundreds of surgeons upon many thousands of patients operated on, together with the apprecia-

tion of the fact that in removing the tonsils in their entirety we are removing at most but a small part of all the lymphoid tissue in the alimentary tract.

In America the modern operation is tonsillectomy. In Europe this operation is rapidly superseding the older, though we are a number of years in advance. During the past six or seven years there has been much groping, much confusion, and the adoption of many new methods only to give them up for something better in the attempt to develop a satisfactory technique. It is apparent from the number and variety of methods advocated by equally good men that an entirely satisfactory technique, applicable to all cases, has not yet been accepted. The aim in every case is to remove the tonsil in its entirety, including the capsule, and nothing else, and without injury to the pillars or palatine arch, or the underlying superior constrictor muscle—the whole operation being done with as little hemorrhage as possible, and with a minimum amount of pain and shock to the patient. During the past five years the writer has at one time or another, for shorter or longer periods, tried the various methods of operation that have been advocated, and which appeared to him as being good, arriving finally at the conclusion that no one method of operating is the best for all cases, and that a satisfactory tonsillectomy is one of the most difficult, if not at times the most difficult, operations the laryngologist performs. To enumerate, let alone describe, the various methods of operation which in the hands of many men give excellent results would prolong this paper unduly, and only the operations which he deems best will be given, without urging or insisting that they are the best, excepting as he has found them so in his own experience.

Since tonsillectomy has been adopted as the proper operation there has resulted in many cases much damage to the soft palate and the pillars through the cicatricial contractions following the wounding of these muscles, and particularly of the posterior pillars. These accidental injuries are mostly following the use of the snare and the finger in finger enucleation, and in operations done under general anæsthesia, where the blood following the first incision has obscured to a great extent the operative field. It is because of this, rather than the hemorrhage, that has resulted in much dissatisfaction with, and results in many cases, of tonsillectomy, and it is to avoid this that one should select each case with great care, fitting the technic to be employed to the case to be operated on.

There are two distinct classes of tonsils to be removed, and two different kinds of patients upon whom to operate. First are the hyperplastic tonsils, which while usually projecting beyond the pillars, are often submerged, though not adherent or but slightly so, to the pillars, and

occur most commonly in children under 15 years, who also have adenoids.

The second are the tonsils more or less firmly adherent to the pillars, with the surrounding fossæ obliterated as a result of repeated adhesive inflammations, resulting in submerged or buried tonsils, and which may be either large or small, often quite flat or thin, occurring most commonly in adults and in children above 15 years of age.

These constitute two well-recognized types, subject, of course, to variations and exceptions, but speaking broadly, the distinctions between the two are clear. The writer employs two distinct methods of operation to achieve the desired result, using in one class a general anæsthetic, in the other local anæsthesia. Either operation should be done preferably in a hospital. The writer has not done a tonsillectomy outside the hospital during the past year.

In the first class occurring in children, a general anæsthetic is administered by an experienced anæsthetist, ether, preceded by somnoform, being used. Somnoform is a great adjunct to etherization, anæsthetizing the patient in a minute and a half, doing away with the disagreeable struggle of the first stage, lessening greatly the amount of ether and the time required. When the tonsils are free between the pillars, or but slightly adherent to them, no matter whether they are very large or small, whether submerged or not, the operation which removes the tonsil most perfectly, with its capsule intact, without injury to the pillars, or to the underlying muscle is, in the writer's experience, the operation advanced and described by Sluder in 1911, and known as the "Sluder operation," and is the one which he employs in this class of case. The instrument used is the one originally devised by Sluder (which is nothing more than a strengthened McKensie guillotine), but having the Ballenger handle—a very great improvement. An electric headlight (the Alexander-Klar preferably) or reflected light is employed. The anæsthetized child is on its back with head level with the body, and mouth gag in place. The operator, as the writer does the operation, stands on the left side facing the patient to remove the right tonsil, holds the instrument in the right hand, the index finger of the left being free to push or insinuate the tonsil through the guillotine, should this be necessary. The instrument, introduced at the corner of the mouth on the left side, crosses the tongue to the opposite side at an angle of about 45 degrees, the distal end of the fenestra being carried behind the tonsil when it scoops it up, drawing it forward and upward until it is opposite the alveolar eminence of the mandible, which latter projection on the lower jaw is utilized as a fulcrum by which the tonsil is pushed through the guillotine, everting it, stripping back or invaginating the plica supratonsillaris and triangularis, this being aided by the introduction of the tip of the forefinger of

the left hand external to the tonsil, gently stroking the latter until it is pushed altogether through the fenestra, when the blade is closed and the tonsil is stripped off just back of the capsule, leaving the muscle uncut and the pillars intact. At times a little of the mucous membrane of the anterior pillar may be removed, but this is not objectionable. The posterior pillar is never cut. Only the tonsil with its capsule is removed, and when it is done properly the result is perfect. After this, the right tonsil is removed in the same manner, a few seconds only being required, as a rule, for the removal of both tonsils. If there is much bleeding, this is arrested by pressure with gauze sponges on long holders, after which the adenoids are removed. Should the tonsil not have been completely enucleated, as sometimes occurs, owing to adhesions or lack of skillful use of the instrument, a second introduction of the Sluder instrument will usually remove the remaining portion of the tonsil with intact capsule. In the event of failure through a wrongful selection of the case for this operation, the adhesions being very strong, or the tonsil very flat and thin, after arresting the hemorrhage a regular dissection of the tonsil and removal with the snare as in the manner described later on, is made. In passing it may be well to call attention to the danger of engaging the uvula in the snare when the dissection and snare operation is done under ether, resulting in an accidental uvulotomy, especially when the tonsil is quite large and there is much blood in the throat, the safest way to avoid it being, as suggested by Ingalls, to grasp the uvula by a long, narrow, self-retaining forceps, keeping the uvula out of the way while the snare is being placed about the tonsil. The dissection operation under ether is likely to be accompanied with a good deal of bleeding. This should be arrested by pressure, the sponges held firmly in the wound cavity or a tonsil hemostat—such as Tivnen's—may be put in place and allowed to remain while the second tonsil is being enucleated. Hemorrhage should be under control before the child leaves the table. In the class of cases under discussion, Sluder's operation is available in more than 75 per cent. of patients, Sluder himself claiming a very much higher per cent. of all kinds of tonsils requiring tonsillectomy. The writer's experience with this method covers about one hundred cases. When the case is properly selected, and the operation skilfully done, the result is perfect and ideal, leaving nothing to be desired. The operation is one requiring a great deal of knack and skill, as well as care in selecting the case. Beck has recently described a method of his own of doing what is essentially a Sluder operation, using, however, instead of the Sluder-Ballenger tonsillectome, a Miller-Pierce snare modified by himself. The advantage claimed for it over Sluder's is that less hemorrhage is likely to occur. I have used

Beck's instrument and method recently, but not sufficiently to be satisfied that it is in any way superior to Sluder's method.

In the second class of cases, namely, adults, with submerged tonsils with more or less pillar adhesion, local anæsthesia is preferred. One to one and a half drams of a one per cent. cocaine solution with five minims of adrenalin chloride 1-1,000 for both tonsils, is injected with the hypodermic needle into the anterior and posterior pillars and external to the tonsils. There have been reported some fatalities from adrenalin, due apparently to an excessive quantity of this drug being thrown suddenly into the circulation, and for this reason only a small and highly diluted amount, distributed over a large area, covering both tonsils, should be employed. In this operation the patient sits up. Owing to the fact that firm adhesions are usually present in adult tonsils requiring operation, Sluder's method is seldom employed, though Sluder himself uses his method with success even in many, not all, of this class of cases. Instead, the tonsillectomy is done by sharp dissection, the tonsil, being grasped with an efficient and for the case, suitable grasping forceps, is drawn outward from its bed and with a sharp-bladed bistoury the mucous membrane of the plica, not the pillar, covering the anterior surface is incised, and carrying the blade upward, the tonsil is dissected outside the glistening capsule by sharp dissection, the dissection being carried around the supratonsillar fossa above, a sharp dissector or tonsil scissors being sometimes used in this region, care being taken not to cut the semilunar margin. The posterior margin is incised in the same manner; the capsule is followed down from above until the tonsil is freely movable and can be drawn out of the fossa. The dissection is sometimes carried down to its lower lobe, where the large vessels enter the capsules, sometimes not; a Peter's snare (without the fenestrum) is now placed around the tonsil, drawn together and quickly removes it. The hemorrhage is slight, seldom disturbing. The dissection is made with great care to avoid wounding the pillars. The operation is usually accompanied with some pain, but this is comparatively moderate. Hemorrhage is altogether less in the cocaine than in the ether operation, consequently the dissection, especially when both tonsils are to be removed, can be done with so much greater accuracy and safety, so far as hemorrhage and avoidance of wounding the pillars is concerned, that the writer endeavors to do the dissection and snare operation, when possible, under local anæsthesia.

After either the ether operation in children or the cocaine in adults, the patient is put to bed and kept in the hospital for 24, occasionally 48. hours. Should hemorrhage recur a few hours after operation, the clot is at once removed, and the bleeding point sought. It is usually at the

lower part of the wound on the external surface, or the posterior and hidden surface of the anterior pillar or on the posterior pillar. If the bleeding vessel can be seen and it is a spurter, it is grasped with the Jackson forceps; if it is not seen, pressure is made with a large, firm gauze sponge, fitting the cavity of the sinus tonsillar, and firmly held in place for several minutes; sometimes the pad is moistened (excess squeezed out) with adrenalin. If these measures are not sufficient, the Tivnen tonsil hemostat is introduced and left in place for 15 to 30 minutes. It has been left on several hours, when the hemorrhage has been arrested by it. These measures are usually sufficient, but if not, the next step is to quickly anæsthetize the patient, catch the bleeding vessel with a Jackson artery hemostat if possible, and ligate the vessel, the ligature being buried in the tissues to insure its holding. Being unable to control the hemorrhage by any of the preceding means, the next thing to do would be to suture the pillars, either by Michel's suture tonsil clamps or by passing a suture completely around the whole tonsillar fossa. Tying the external carotid is a final resort, but its necessity rarely arises. Personally, the writer has never had to resort to either this or to suturing the pillars. When a slight hemorrhage continues, it will frequently stop after the patient has been quieted by a hypodermic of a one-sixth of morphia, the morphia acting both as sedative and a heart depressant. Orthoform in tablet or powder form affords the adult patient great relief from the pain and discomfort during the first five to seven days after operation, and is always prescribed. Children rarely complain much of the pain.

A NEW TONSIL DISSECTOR. A PLEA FOR CLEAN TONSIL DISSECTION, AND A METHOD OF DOING IT.

By G. P. COOPERNAIL, M.D.,
BEDFORD, N. Y.

FOR several years past I have been using the Allis dry dissector as one of the instruments in dissecting the faucial tonsils out. About six months ago I saw a noted throat specialist use the same dissector in liberating the tonsils. He informed me he found it a very useful instrument and had been using it for sometime. With the thought of improving the dissector for tonsil work I devised the tonsil dissector here illustrated, one end of the



dissector is a facsimile of the Allis dry dissector, the other end is more hook shaped and has a moderately sharp cutting edge on the inside of the hook.

It is of sufficient weight to impart a comfortable sense of balance and resistance to the

operator's hand. The length enables the operator to manipulate it without obstructing his view.

I use the sharp edge for the superficial dissector and the blunt end for the deep, thereby eliminating the chances of cutting any of the large vessels. At the present day I think no one will question my statement, when I say that the only way to take a tonsil out is to take it out clean. Few surgical operations are so generally done badly as those upon the tonsils. Nevertheless there has been great strides in doing better tonsil work, in the past few years. Tonsillotomy is an easy but an utterly unjustifiable operation.

Such an operation may relieve the mechanical obstruction of the passage of air by removing the projecting portion. In healing the cicatricial tissue seals up the deeper portions of the tonsils that are left in, this will prevent the throwing out of the secretions and detritus which will continue to be produced by the remaining glandular tissues. All constitutional infections as tuberculosis, rheumatism, etc., starting in the tonsils are rendered more probable by partial removal. As far as danger of hemorrhage is concerned it is much more likely to occur when there is incomplete removal. As far as preventing attacks of tonsillitis it does not, on the contrary they occur with greater severity when part is left in. We have all seen some of the worst inflammatory conditions when the tonsils have been chopped off leaving the most important part in.

The operations of tonsillotomy always seems to me like a breaking a crown off a diseased tooth, and leaving the root in. (The part that gives all the trouble.) With the aid of the dissector it is an easy matter to separate the tonsils and remove it capsule and all. It can be done in most cases from three to five minutes.

There is a line of separation between the tonsils and anterior and posterior pillars which can be followed with a blunt or moderately sharp dissector without cutting into either the tonsil or muscle of the pillars. With this view in mind a sharp knife or scissors should not be used in tonsil dissecting.

My method of removing the faucial tonsils are as follows: First, anesthesia, with children I always use ether given through a Ferguson Gwathmey mouth gag, which is a great help in saving time as you do not have to stop and give more of the anesthetic before the tonsils are removed.

With adults I use a saturated solution of cocain in adrenalin 1-1000, painting it on the throat. If one works slowly and with caution, they can be removed with but little pain. It is a good plan to remove one tonsil from an adult at a sitting. Let the throat heal before removing the second tonsil.

I first dissect the tonsil loose from the an-

terior pillar. Then the apex which one will often find buried quite deep in the supratonsillar space, then separate the posterior pillar. With my finger I crowd the tonsil down away from its attachment to the superior constrictor muscle.

If the tonsil has not suffered from many previous inflammatory conditions, it is surprising how easily you can push it down from its bed with the finger after it has been dissected loose from the pillars, and out of the supratonsillar space. This leaves a small attachment at the lower part which I cut off with the cold wire snare. With a little care the tonsil can be shelled out as clean and smooth as a bean, capsule and all.

It is not very neat surgery to tear or fray a tonsil.

Another point in favor of clean dissection is they heal more quickly and are less painful. After the tonsil is cut off with the snare, I hold a gauze sponge on a sponge holder dipped in adrenalin solution tight against the bleeding surface.

In children I have an assistant hold the sponge against the bleeding surface after removing the first tonsil and keeping it there, when I proceed to remove the other one wasting no time. I do not claim that this dissector is superior to many others. No doubt if an operator is used to a certain instrument he can do better work with it. But I am sure those who will try this dissector will find it a very convenient instrument. A word of apology for writing this article, I appreciate that the tonsils and vermiform appendix have been thrashed clean the last few years.

LESSONS FROM A CASE OF TONSIL AND ADENOID OPERATION.*

By T. H. FARRELL, M.D.,
UTICA.

ON June 12, 1912, E. H., aged 13, was brought to the hospital by his physician for circumcision and removal of tonsils and adenoids. His history stated that he had had chorea for four years and been treated for it in a desultory manner but unsuccessfully.

His general health had been fair up to one month previously, when he came down with a very mild attack of measles, which kept him in bed one day. However, he had failed steadily ever since, so that on coming to the hospital he looked poorly nourished and his choreic spasms were very marked. He was deaf. We learned later that his father's mother and sister had died of tuberculosis. (His father had deserted the family). Temperature, pulse and respiration if taken before operation not recorded.

At 9 A. M., an hour after reaching the hospital, he was given a hypodermic of morphine and atropine and taken to the surgery, where

* Read at the annual meeting of the Fifth District Branch, Medical Society State of New York, at Oswego, N. Y., October 3, 1912.

ether was administered and the circumcision was performed, followed by tonsillectomy (by means of dissection and snare) and adenectomy. He was away from his room in all about one hour. During the operation on his throat his breathing was shallow and his skin dusky. However, he reacted well after discontinuance of the ether and the usual convalescence was expected.

Within one hour he vomited a large amount of blood, which was reported over the telephone, and an icebag ordered; as the bleeding continued, evidenced by vomiting of more blood, an injection of antitoxin (3,000 units) was ordered and given at 12.15 by the house surgeon and proctoclysis started at 12.30.

About this time I returned to the hospital and found the patient very pale from loss of blood. On examination the bleeding was seen to come from the naso-pharynx and a postnasal plug was at once put in place. As oozing continued another injection of antitoxin (3,000 units) was given at 3.30 and proctoclysis resumed. At this time his temperature was 104 deg., pulse 125, respiration 28.

At seven infiltration under the breast was resorted to on account of intolerance of the rectum. 8.30 P. M. temperature 105.4 deg. (axilla), pulse 150, respiration 52.

At this time the patient was quite unconscious and a fatal termination appeared imminent. Drs. Gifford and Gage were called in consultation with the family physician and myself.

No satisfactory explanation of the high temperature could be suggested after careful physical examination, though of course the two things uppermost in our minds were the hemorrhage and the antitoxin. He frequently emitted a peculiar cry, which suggested meningitis, but other symptoms of this were wanting and later we found that this cry was one of his choreic symptoms.

Under cold sponging and stimulation with strychnia the temperature fell by midnight to 101 deg., only to rise again at 2 A. M. to 104. By morning it had fallen to 100.2 by rectum, pulse 140, respiration 52.

For an hour the patient was fairly rational and his condition seemingly better, when he again relapsed into semi-unconsciousness.

8.30 A. M. he passed a small undigested semi-formed stool. 11 A. M. vomited two pus basins full of undigested food, apparently meat and potatoes. At noon he was irrational, talking about his games, very restless and oozing blood from the nostril. Moving him at this time seemed to cause pain and was accompanied by some rigidity of the neck muscles and the peculiar cry.

At 6 P. M. conditions were unchanged. About this time he vomited a large amount of ether vomitus (mucus and bile). At midnight he again vomited a large amount of greenish fluid.

Third Day.—On the morning of the third day

his temperature was 100.4 deg., pulse quite imperceptible at times. The oozing of blood from the nostril had stopped and the post-nasal plug was removed. No bleeding followed. Calomel and soda in small doses was started. At 11 A. M. the infiltration of two quarts of normal saline was commenced by the house surgeon. At 6 P. M. the patient was restless and pulse thready. Infiltration again started, of which he absorbed three pints. There had been no vomiting throughout the day.

Fourth Day.—Patient rested better. Pulse was stronger, bowels moved freely, and he took some nourishment and retained it all.

Fifth Day.—Patient resting fairly. Takes nourishment well. Coughing considerably but not expectorating. Temperature rose to 103 deg., pulse 140, respiration 48. Dr. Gifford, who was looking after the medical aspects of the case, diagnosed a pneumonia on the left side.

Sixth Day.—Temperature, pulse and respiration continued high; however, he was taking plenty of nourishment and slept the greater part of the preceding night. Bowel movements have become natural.

Seventh Day.—Prevented from sleeping by an almost constant cough. Mental condition greatly improved. Takes nourishment well. Complains of numbness in both feet, which are swollen.

Eighth Day.—Slight improvement in temperature, pulse and respiration. Coughs less and sleeps more. Expectorating thick yellow phlegm.

Ninth Day.—Temperature below 103, pulse 140, respiration below 45. Continues to cough and expectorate but got a fair amount of sleep. Complains of pain in cardiac region. Muscular twitching more marked. Examination of the sputum showed a mixed infection.

Tenth Day.—Temperature, pulse and respiration the same. Pain all day on left side. Raised quantities of frothy and also thick, yellow sputum streaked with blood.

Sixth to Tenth Days.—For the next five days the temperature, pulse and respiration continued high, with slight remissions. He took plenty of nourishment and his bowel movements became natural. His sleep was greatly disturbed by the incessant coughing. He complained of pain in cardiac region and numbness of both feet, which were swollen. The muscular twitching was more severe. His mental condition improved greatly during this time (seventh day). Examination of sputum showed a mixed infection, staphylococcus and streptococcus.

Eleventh Day.—Slept well, but was exhausted by persistent cough. In the evening his temperature fell to 101 deg., only to rise later to 104 deg.

Twelfth Day.—Dr. Gifford found a pneumonia on the right side. Temperature holds about 104 deg., respiration 45 to 50. Takes his nourishment well.

Thirteenth and Fourteenth Days.—Cough continues. Patient very nervous. Eats well.

Fifteenth Day.—Is very restless. Pain in occiput; muscular twitching, especially of eyes. Jaws are set, so that we feared tetanus. Is distended with gas.

Sixteenth Day.—Temperature fell to 100.5 deg., but rose again to 104.5 deg. Patient hears well to-day for the first time. Widal's serum test for typhoid was negative.

Seventeenth Day.—Expelled a large round worm and his tetany cleared up. Cough continues. Sleeps fairly, eats well. Temperature, pulse and respiration keep up.

Eighteenth Day.—Twitches and moans a great deal. Distended with gas. Falling temperature, pulse and respiration.

Nineteenth Day.—Complains of earache (right) aggravated by twitching of face. No deafness. Temperature rose to 103.5 deg.

Twentieth Day.—Temperature down to 101 deg. Pain continues in the ear. Membrana tympania found to be normal. Twitching of face very bad. Less cough. Resting better.

Twenty-first Day.—Despite temperature 102-104 deg., pulse 140, respiration 50 to 60 and pain in his ear, the patient is very bright and anxious to go home to celebrate the Fourth of July.

Twenty-second Day.—Twitching less severe. Redness and swelling manifest over right parotid gland with pain all over that side of the face.

Twenty-third Day.—Appetite good. Bowels normal. Moves a great deal. Coughed continually for four hours in the night.

Twenty-fourth Day.—Pain in left side, due to pleurisy. Expelled a large round worm.

Twenty-fifth Day.—Patient keeps bright. Was taken out on porch in wheel chair. Parotiditis cleared up under ichthyol ointment.

Twenty-sixth Day.—Coughing spells are accompanied with cyanosis.

Twenty-seventh Day.—For past week temperature has risen each day to 103 deg., but has fallen each day till to-day it reached 98 deg. Pulse keeps rapid and respiration hovers around 40.

Twenty-eighth Day.—His condition during the next week gave us good hopes. Circumcision wound healed by first intention and also smooth healing of throat. He was eating and sleeping well. The choreic movements disappeared; he was coughing and raising considerably but with less distress; his hearing was good, his mind clear and active, his stools normal.

Thirty-second Day.—His temperature varied in the day from normal to 102 or 103 deg.

Thirty-third Day.—On this day he complained of inability to turn on right side and it was found that he had an empyema. In spite of this his temperature range on this day and the next was between 98 and 99.5 deg.

Thirty-fifth Day.—Dr. Douglass evacuated a large quantity of pus from the pleura.

Thirty-sixth Day.—Despite free drainage temperature rose to 102 deg. Cough is very slight.

Thirty-seventh Day.—He became very restless again and temperature rose to 105 deg.

Thirty-eighth Day.—Right lung is recovering from its collapsed condition.

Thirty-ninth Day.—Refused nourishment and apparently sleeps most of time. Dr. Gifford found empyema of left pleural cavity.

Fortieth Day.—Unconscious all day. Died, 7.15 P. M., of exhaustion.

This case has an interest of its own apart from its relation to the tonsil and adenoid operation, but it serves to emphasize some questions regarding this operation that are worthy of our consideration.

1. Is the present method of enucleation of the tonsils and adenoids a minor or a major operation?

The benefits which flow from this operation are so well recognized that I pass over them, but what about the possible complications?

Is it not fair to assume that without operation this boy, whose history has been read to you, would have escaped a double pneumonia, pleurisy, empyema, tetany, and possibly death?

On the other hand, might he not have enjoyed the benefits of the operation and escaped the complications if more care had been taken?

Then, too, in estimating the gravity of this operation we must consider the possible accidents, such as injuries to the tongue and soft palate, including the pillars and uvula, injury to the eustachian tubes, inspiration pneumonia, and severe hemorrhages, primary and secondary.

I think it was a mistake in this case and is in most others to tack the tonsil and adenoid operation on at the conclusion of another, even simple, operation. Especially is this true if the patient's general condition is below par.

The risks during and after complete removal of the tonsils and adenoids at the hands of the most skillful operator are such as to justify a much more serious attitude towards this operation on the part of the profession.

2. Who is responsible for the preparation of these patients, and how thorough should this preparation be?

A physician telephones or writes the surgeon, asking if he may bring a patient for operation at a certain time. The child comes to the office or hospital a few minutes before the time set. The surgeon assumes that the child is prepared, or even asks the physician, who in turn assumes that the child is prepared, or even asks the parents, who frequently out of their ignorance answer in the affirmative. The converse is just as frequent—the parents trust to the physician, the physician trusts to the surgeon. In many cases the result is the same, viz., that the child is not prepared either in mind or body for the administration of ether and a serious operation.

My own conclusion after much experimenting is that as a rule the least justifiable preparation is to send the child, accompanied by one parent if need be, to the hospital the day before. The diet is regulated, a proper laxative is given and positive results obtained. A complete history (hæmophilia) is taken, urinalysis and physical examination of heart and lungs is made. In the morning, if no contra-indications has developed, the child is brought down to the surgery with a quiet mind and an empty intestinal tract, ready for the anæsthesia, which should be profound. The patient is kept in the hospital at least twenty-four hours after operation.

This method, if carefully adhered to, forestalls many of the accidents and complications and provides for combating them should they occur.

3. Is antitoxin of any value in controlling hæmorrhage in these cases?

Dr. C. F. Theisen has reported a number of cases of hæmorrhage in his own practice in which antitoxin (diphtheritic) was used to advantage. I have used it a number of times in hæmorrhages from the nose and throat, after other measures had failed, with benefit.

It seems to be a fact that the introduction of the fresh blood serum, say of a rabbit, will greatly increase the coagulability of human blood. This is not generally available in the time of an emergency and the sterile horse's serum used in preparing and marketing diphtheritic antitoxin is pressed into service. I find, however, that most of the diphtheria antitoxin on the market to-day (including the New York State product) is not a serum but a concentrated antitoxin (or rather globulin) is an isotonic physiological salt solution. Of course, there is no advantage in administering this concentrated product.

Previous to the case just detailed I have not seen any untoward effects from the use of antitoxin, and the extremity of my dilemma seemed to justify the use of such a potent complex substance for the sake of the hæmostatic property and innocuous serum content.

Hereafter I would hesitate to introduce antitoxic serum into the circulation for the control of hæmorrhage without first exhausting all other measures.

These are some of the questions which have suggested themselves to me in thinking over this somewhat complex case.

Many times the child seemed to be on the verge of recovery, only to relapse with an unlooked-for complication. With one more lung he might have pulled through.

It was not the loaded stomach and bowel alone, it was not the prolonged anæsthesia alone, it was not the hæmorrhage alone, it was not the antitoxin alone, but a combination of these and possibly other factors which consummated his death.

Let us try and profit by our mistakes

BLINDNESS AS THE RESULT OF INTRA-OCULAR DISEASE.*

By EDGAR S. THOMSON, M.D.,
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INTRA-OCULAR disease, undoubtedly, plays the most important rôle in the production of blindness.

This has been proven by the investigations of Magnus (*Die Blindheit*, Breslau, 1883, S. 240), Trousseau (*Archiv. d'Oph.*, 1892, XII, 218), and Oppenheimer (*Trans. Am. Oph. Soc.*, 1891, VI, 156). Their tables are given in full in Minis Hays' article in Norris and Oliver's *System*, Vol. II, p. 419.

Magnus gives two series of cases, the first consisting of 1,037 cases, is a classification according to the anatomical seat of the disease. The main items are as follows:

Optic nerve	23.33%
Uveal tract	22.85%
Conjunctiva	15.23%
Glaucoma	13.11%
Retina	10.51%

The second series, of 2,528 cases, gives 67 per cent. as due to idiopathic disease, 18 per cent. due to general disease, 10 per cent. traumatic, and nearly 4 per cent. congenital (the decimals are omitted). In this series disease of the optic nerve, including glaucoma, is recorded at 27.68 per cent., while disease of the uveal tract and retina is 18.67 per cent.

Trousseau's statistics are based on 625 cases, of which those caused by intra-ocular diseases are as follows:

Optic Atrophy	20.64%
Glaucoma	10.56%
Neuritis .....	.48%
	<hr/>
	31.68%

Irido-choroiditis	12.00%
Choroido-retinitis	3.20%
Myopic Sclero-choroiditis	2.24%
	<hr/>
	17.44%

Retinal detachment	5.92%
Retinitis pigmentosa	3.68%
Choroido-retinitis	3.20%
	<hr/>
	12.80%

He finds that atrophy of the optic nerve is the most frequent cause of blindness, and after this comes purulent ophthalmia,* irido-choroiditis, glaucoma, etc.

Oppenheimer gives a series of 572 cases, which

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 18, 1912.
* It should be said that at the present time purulent ophthalmia is steadily falling back on account of our methods of prophylaxis and treatment.

is not classified in exactly the same way, but in which the intra-ocular conditions are as follows:

Optic atrophy	26 cases.
Glaucoma	31 "
Choroiditis and iritis.....	10 "
Detached retina	3 "
Retinitis pigmentosa	8 "
Retinitis	1 "
Iritis	5 "

All three give idiopathic disease as the most usual cause of blindness, varying from 48 to 67 per cent., while blindness due to general disease varies from 18 to 23 per cent, from traumatism (Magnus, 10.76 per cent., Trousseau, 16.32 per cent, Oppenheimer, 28.67 per cent.), congenital blindness, between 3 and 4 per cent.

These tables agree as to the main proportions, with such variations in the diseases which are represented by a small number of cases, as might be expected. Undoubtedly, optic atrophy is the most frequent cause of blindness, with purulent ophthalmia a close second. If we add Glaucoma, in which the percentage is about one-half that of other causes, we shall find that diseases affecting the optic nerve far outrun the other causes for blindness, comprising about one-third of all cases.

Optic Neuritis.—The severity of this condition, and its causation, are important factors in determining the amount of secondary atrophy and the degree of blindness produced. On account of the delicacy and vulnerability of the optic nerve any inflammatory condition, however slight, is of importance, and it should never be forgotten that a total atrophy may follow what is apparently a mild neuritis, either through persistence of the cause, or continuance of the connective tissue changes, which so frequently follow optic neuritis in greater or less degree.

As regards cause, probably all cases are due to pressure, changes in the brain, or some systemic or local toxin.

According to Mauthner, intra-cranial diseases give rise to at least four-fifths of the cases, which includes, of course, tumors of the brain, infectious meningitis, brain abscess, sinus thrombosis, etc. The toxic agents are most frequently syphilis, alcohol and tobacco, and the specific poisons of the infectious fevers, or of various nutritional diseases, such as diabetes, nephritis, anæmia, etc.

A particularly interesting group of cases are those due to disease of the sphenoid and ethmoid sinuses. In whatever manner the inflammation may be produced it is certain that the curetting of the sinuses gives brilliant results in properly selected cases.

Many other causes are cited by different authorities, most of which come under the "toxic" class. Clinically, however, it is a fact that in many instances the cause of the neuritis remains

obscure, and as successful treatment in a great measure depends upon the early removal of the cause, it is apparent why so many cases of consecutive atrophy occur.

Simple Atrophy.—Atrophy without any demonstrable inflammatory first stage, is most frequently due to spinal affections, of which locomotor ataxia is the most frequent cause. Other causes are progressive paralysis of the insane, disseminated sclerosis, the presence of intracranial or orbital tumors, the violence caused by any condition producing a sudden exophthalmos, as in deep orbital hemorrhage, and finally, the toxic action of certain drugs, notably quinine.

Glaucoma.—Whether the case be acute or chronic, it seems just to say that the main element in the production of glaucomatous atrophy is the intra-ocular pressure. The uncertain factor in the case is the amount of resistance possessed by the lamina cribrosa and the supporting tissues of the papilla. There is no question but that a wide variation exists in the relation of these two factors, and the probability is that in the so-called chronic cases, the sustaining tissues give way before an intra-ocular pressure which is not far from normal.

As is well known, every case of glaucoma, unchecked, goes on to total blindness, so that lacking precise information to enable us to combat the condition in its incipency, it seems most reasonable and expedient to resort to surgical measures to relieve the intra-ocular pressure whenever it is possible to do so. The value of iridectomy in the early stages of acute glaucoma is unquestioned, and the proper time to perform the operation is as soon as the diagnosis has been made and before any pressure effects have occurred, always providing, of course, that there are no contra indications. In the chronic cases, some of the newer operations, such as the Lagrange iridectomy, the Herbert trephining operation, etc., which aim at the formation of a permanent filtration spot in the sclera, are undoubtedly founded on logical lines, and have gone far toward justifying a hope that something definite may be accomplished by lowering the normal tension.

The miotic treatment is but postponing the evil day, for there is no evidence that a normal tension can be reduced by this class of remedies.

Iritis and Cyclitis.—Next in importance is disease of the iris and ciliary body, or as so often occurs, both in combination. It is frequently of demonstrably toxic origin, and is caused by syphilis, rheumatism, tuberculosis, gonorrhœa, infectious fevers and various other causes.

Traumatic irido-cyclitis may be caused by mechanical injury (traction or contusion), chemical irritation (swollen lens matter), or infection through perforation of the ocular coats.

Sympathetic irido-cyclitis is thought by many to be a toxæmic process.

All forms of iritis, save perhaps the very mildest types, lead, if not treated, to blindness through adhesions of the iris to the lens, seclusion of the pupil, and secondary glaucoma.

Where any considerable inflammation of the iris exists, plastic material is thrown out, adhesions are formed, which constantly increase in size through fresh accessions of exudation, and the result is ultimately secondary glaucoma, lymphatic derangement, and phthisis bulbi. Where inflammation of the ciliary body is at all marked, it is usual to find diminution of the intra-ocular tension indicating lymphatic derangement. This, if unchecked, may lead to acute softening and atrophy of the globe, or a permanent hypotony with steadily progressive degenerative changes until the same result is reached.

Fortunately, most forms of iritis and cyclitis respond readily to treatment, and this fact, taken in consideration with the violent pain which accompanies them, causing the patients to seek early aid, accounts for the fact that the percentage of blindness from this cause is no higher.

Sympathetic irido-cyclitis rarely recovers under the most energetic treatment, and would probably never do so spontaneously.

Traumatic irido-cyclitis is of all grades of severity and much depends upon the circumstances of the individual case,—the severity of the wound, the amount of mechanical injury, etc.

The severity of the intoxication, or infection, is the most important element to be considered. Probably, in many cases, toxins are absorbed through the wound, although it must not be forgotten that local traumatism may, by lowering the resistance, determine an attack of intoxication through endogenous causes.

Acting on this idea, I am in the habit of sealing non-infected perforating injuries of the cornea and sclera by a conjunctival flap, after the method of Kuhnt, and am convinced that iritis is less frequent and less severe in my wound cases than formerly, when I did not use a flap. For similar reasons and in order to secure prompt healing, I always use a conjunctival flap in cataract extraction.

Even a sterile wound of the ciliary body is apt to be followed by acute inflammation, lymphatic derangement, cicatricial formation, and finally, phthisis bulbi, or perhaps sympathetic inflammation of the fellow eye; while introduction of any toxic substance is followed by much more severe reaction than in the case of the iris. The exact reasons for these facts are unknown, but the facts themselves are well recognized.

Infection of the iris or ciliary body is always followed by general destruction of all the intra-ocular tissues, and is one of the conditions before which the surgeon seems absolutely helpless. Various means to avert the infection have been

advised, such as the introduction of iodoform, argyrol, etc., free lavage with bichlorid of mercury, cauterization of the wound so as to stop the supply of infective material, etc. All have failed in my hands, and when I read that they have succeeded I am inclined to doubt that any but the mildest type of intra-ocular infection has taken place.

Choroiditis at times accompanies irido-cyclitis, but frequently occurs alone. It is relatively benign as regards absolute blindness, though unless promptly treated, a certain amount of destruction of the overlying retina and impairment of vision is the rule. There is much evidence that it does not tend to such complete destruction of the eye as iritis and cyclitis, neither is it as amenable to treatment, although treatment undoubtedly limits the destructive effects in many cases.

The largest proportion of the cases is most probably toxic in character, and frequently caused by the same agencies as iritis and cyclitis. In many cases, however, the cause remains obscure, no matter how carefully it may be searched for.

I am of the impression that many of the cases are due to auto-intoxication, and am accustomed to have the digestive tract carefully investigated and treated with what seems to me to be good results.

Myopic Choroiditis.—No doubt many of the choroidal changes found in myopia are degenerative, and are due to the mechanical violence of the stretching in the elongation of the globe. But on the other hand, toxic influences cannot be excluded, and, in fact, are more apt, theoretically, to attack a tissue of lowered resistance than one which is normal. The usual points in the treatment of choroiditis should be covered in the myopic cases, even more carefully than in ordinary low-grade plastic cases, for the results are less good and the damage to the vision more extensive.

However, in this country myopia is greatly decreasing, thanks to our methods of prophylaxis, and blindness from this cause is relatively uncommon.

Retina.—Detachment is the most important retinal condition leading to blindness, and is represented by 4.75 per cent. in Magnus' table, which, of course, represents idiopathic cases.

It occurs most frequently in myopes, most probably as the result of the traction on the retina by the vitreous body which does not enlarge proportionally as the axial length of the globe increases. This is still an unsettled point, but it is a well-known fact that the higher the myopia the greater the tendency to detachment. It also occurs in many cases of cyclitis as the result of contraction of plastic vitreous exudates, and is almost invariably found in the histological examination of phthisical eyes. It occurs less frequently as the result of extravasations beneath

the retina, as the result of a jar or blow about the orbit. It also occurs as the result of the growth of a choroidal tumor, usually sarcoma. Finally, many cases occurring spontaneously, cannot be explained in the present state of our knowledge.

Idiopathic detachment usually occurs in both eyes, though one is affected in advance of the other and is apt to lead to blindness through steady enlargement of the detached area until it becomes total. The explanation of this lies in the fact that the deeper layers of the retina receive their nutrition from the chorio-capillaris of the choroid, and when cut off from their nutritive supply degenerate and shrink. A large detachment of the retina in some way exerts a very bad influence on the lymphatic circulation of the eye-ball, predisposing to hypotony, attacks of irido-cyclitis, and finally, phthisis bulbi.

Retinal detachment is particularly intractable to treatment, both medical and surgical, and if founded on myopia, is almost certain to lead to blindness. Sub-retinal puncture and evacuation of the serous fluid is effective almost solely in the recent traumatic cases, and as these are in the great minority it follows that the larger number of cases met with clinically turn out badly.

A careful search should always be made for any constitutional condition bearing on the case; the patient should be confined to bed for a time and active elimination through the skin and kidneys secured.

Retinitis occurs in a variety of forms, and if not promptly checked leads to local degeneration of the retina and more or less impairment of vision, though seldom to absolute blindness unless very widespread. It is usually the expression of some underlying general disease, as nephritis, diabetes, leukæmia, syphilis, or disease of the vascular system, and requires the appropriate treatment for these conditions. In nephritis and diabetes the development of a retinitis is of especially grave prognostic import as regards the patient's life.

Atrophy of the retina occurs as the result of the pressure effects, of hemorrhages, or exudations. A special form of retinal atrophy is *retinitis pigmentosa*, or pigmentary degeneration of the retina, which runs an exceedingly chronic course, with progressive diminution of the light-sense, and contraction of the visual field, until blindness supervenes, usually in the advanced years of life.

Two special forms of vascular disease should be mentioned on account of their tendency to lead to blindness, although they are unioocular in character.

1. *Embolism of the Central Artery of the Retina.*—This usually occurs in connection with some form of valvular disease of the heart, so that a clot, or perhaps other solid material, is washed into the artery and occludes it. As the

retinal arteries do not anastomose, compensatory circulation is impossible and blindness ensues through retinal atrophy. The only exception to this is where some portions of the retina are supplied by cilio-retinal vessels from the anastomosis around the nerve head.

If such a condition exists, a portion of the retina is saved, but as it is only a small portion, as a rule, and eccentrically situated, very little useful vision is retained.

2. *Thrombosis of the Central Vein* and its branches occurs as the result of general arterio-sclerosis in the majority of cases. The vein is enormously dilated, and the retina is covered with extensive hemorrhages, which in subsiding leave a widespread atrophy. Frequently the lymphatic disturbance in such a case is so great that secondary glaucoma and total blindness supervenes, and enucleation becomes necessary on account of the pain.

Gloma of the retina and *sarcoma of the choroid* need only be mentioned in the present connection. In each the eye is lost through development of the tumor growth, and, indeed, enucleation is frequently demanded, especially in choroidal sarcoma, before the eye becomes blind.

INTESTINAL LESIONS DUE TO CON- TUSIONS OF THE ABDOMEN.*

By GILBERT D. GREGOR, M.D.,
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MR. PRESIDENT AND GENTLEMEN:

MY object in taking up this subject was not so much to get it before a gathering of surgeons as it was to bring it to the attention of the general practitioner, my belief being that such injuries are of more frequent occurrence than is generally supposed.

Large manufacturing districts have accidents that are peculiar to the type of industry in which men are employed; such as machinery accidents, consisting of contused and lacerated wounds, compound fractures, etc. These cases are usually within easy reach of hospital facilities and the care of competent surgeons, while the cases that I wish to discuss are of more frequent occurrence in the rural and agricultural districts that are often distant from hospitals and the care of those skilled in surgical diagnosis and practice. Further, machinery accidents usually carry with them the visual evidence of the necessity for surgical aid, while these under consideration present no visual evidence of any injury, and yet in no class of cases is neglect of prompt and proper aid so fraught with disastrous consequences.

The most common cause of intestinal lesions from contusion of the abdomen is blows upon

* Read at the annual meeting of the Medical Society of the State of New York, at Albany, April 17, 1912.

the abdominal wall. These consist of kicks from horses or cattle; blows delivered by the fist; by articles thrown either purposely or accidentally, as a stick of wood from a circular saw; a bolt from a revolving shaft; a brick from a belligerent companion; or a baseball, as in one of my own cases. Falls, striking the abdomen on some sharp article; running against some sharp obstacle, as the pole of a wagon; being thrown from a wagon and striking the abdomen against a fence-post, are all methods of producing intestinal rupture that have been proven either by operation or autopsy.

Crushing injuries are a prolific cause of intestinal lesions of a serious nature, but such injuries are frequently associated with injuries of other organs, especially of the liver and spleen. The passage of a wagon wheel over the abdomen and being pinched between the bumpers of cars, are the most frequent cause of this class of injuries.

Subcutaneous injuries of the intestine may also be caused by indirect violence, as when a patient falls from a height and strikes on the feet or buttocks. In this type of injury the bowel is usually torn from its moorings at some of the fixed points, as at the duodeno-jejunal junction or in the vicinity of the cecum.

We then have three types of injuries that produce intestinal lesions. First, that produced by a rapidly moving object effecting a very circumscribed area of the abdominal wall. Second, the crushing injuries that force the abdominal wall against the vertebral column or the pelvic bones, thus catching the bowel between two solid objects. And third, the tearing type of injury, as when a patient falls from a height producing an abnormal and violent excursion of the bowel. The first class of injuries are by far the most prolific in producing intestinal lesions. The manner in which such injuries produce intestinal rupture has been a matter of considerable controversy, and it is doubtful if a satisfactory explanation has yet been produced. Certain conditions, however, are nearly always combined in the production of these injuries. These are: An object of high velocity; a small point of impact; the unexpectedness of the blow, that is, the abdominal muscles are caught off their guard. It is a matter of general knowledge that slow moving vehicles may pass over the abdomen of prostrate individuals without producing any intra-abdominal injury. In such a case the abdominal muscles are prepared for the blow and are able by rigid contraction to protect the abdominal contents. On the other hand, when the blow is unanticipated, the abdominal muscles are relaxed and there is nothing interposed between the contusing force and the abdominal contents, except that

produced by the cushioning effect of the thickness of the abdominal wall and the clothing of the patient. The condition of the bowel at the moment of the receipt of the blow is also of great importance. A flat or collapsed bowel will escape injury, while one distended with fluid or gas is very liable to suffer injury or to rupture.

In 1887, Dr. B. F. Curtis in a study of 116 cases and from experimental work upon the cadaver, came to the conclusion that the mechanism of such injuries was "that the intestine was ruptured by being crushed between the contusing body and the bony parts, chiefly the vertebra and pelvis." Since Dr. Curtis' paper much has been learned regarding these injuries, and the explosive theory has been introduced. This supposes that the blow forces gas or liquid contents through the bowel until a kink is reached that temporarily closes the gut and a blow-out occurs. It is practically on the same principle that an imperfectly inflated automobile tire will blow out on a rough road, while an even pressure with proper inflation would prevent such an accident. I believe it possible that a violent peristaltic wave induced by the blow, might produce the same results.

From a study of the few cases of my own and from cases related to me by medical friends, I am of opinion that the explosive theory explains more of these injuries than the crushing theory, notwithstanding most authorities are to the contrary.

The portion of the bowel most frequently injured is the lower part of the ileum, though no part of the alimentary tract within the abdominal cavity is exempt from such injuries. Those portions that are best protected by a bony environment are the least frequently injured. Dr. Shink in a paper on this subject before the American Medical Association, states that the fixed portions of the bowel were the most frequently injured; that is the upper jejunum and the lower ileum. This type of injury is most frequent from indirect violence, but as most of these injuries are produced by direct violence, and as much of the ileum is more or less in contact with the external abdominal wall, it therefore is more exposed to such accidents and therefore we find the lower ileum most frequently injured.

In all series of cases that have been reported during the last few years, about the same ratio of frequency in different portions of the bowel obtains. For instance, in seventy-nine cases where the point of injury was definitely stated we have: the duodenum was injured ten times; the jejunum twenty; the ileum forty-two, and the large bowel six times. The nature of the lesion may vary from a small blow-out to a complete severance of the gut. In crushing injuries the lesion may be multiple; the rup-

ture may be incomplete at first and later become complete by necrosis of the injured area. The injury may be associated with a tearing of the mesentery that is liable to give rise to a dangerous hemorrhage.

The symptoms produced by abdominal contusions depend at first upon the shock to or injury of the abdominal sympathetic system, or to be more exact according to Crile, to the concussion being transmitted to the pericardial portion of the diaphragm, rather than to the associated intestinal lesions. These first symptoms rapidly disappear or are merged into the symptoms of the graver lesions. The symptoms are at first then: those of shock; faintness; pallor; nausea and perhaps vomiting; coldness of the skin; a weak and thready pulse; a subnormal temperature; and acute abdominal pain and tenderness. Such symptoms may appear alarming at first, but only indicate the nerve shock. If, however, after five or six hours, the pulse increases in rapidity, if vomiting occurs, or recurs, if it was present with the initial symptoms, if there is increasing abdominal pain, associated with muscular rigidity, and the face takes on an anxious expression and the temperature goes above the normal point, then we can assume an internal injury has occurred that justifies an exploratory incision.

The rapidity with which the symptoms of intestinal rupture supervene upon those of shock, depend largely upon the size of the rupture and the consequence rapidity with which the peritoneum is soiled by the intestinal contents. If the opening be small, the soiling is gradual, and consequently the symptoms develop gradually, or possibly the opening may be plugged for a time by the mucous membrane, in which case the symptoms may be delayed for a number of hours. If there is associated with the injury of the bowel an extensive tear in the mesentery and consequently a serious hemorrhage, the primary symptoms of nerve shock are merged into those of shock from hemorrhage. Usually within four to six hours, after the primary shock has subsided, the patient will present symptoms of peritoneal irritation, consisting of abdominal pain and tenderness, and muscular rigidity; the pulse becomes more rapid; the temperature somewhat elevated; nausea occurs and possibly vomiting and the bowels are obstinately constipated. From this point on, the case presents the usual symptoms of a rapidly spreading peritonitis, which if not arrested by operation, speedily terminates in death. If the perforation be small and the extravasation of intestinal contents be prevented for a time by muscular spasm of the gut, or by plugging with mucous membrane, adhesions may form about the injury, which will prevent for some days, the soiling of the gen-

eral peritoneal cavity, as in one of my own cases. Spontaneous recovery is even possible by rupture of a fecal abscess on the surface of the abdomen. Such a fortunate outcome must be extremely rare.

Given then, a case of abdominal contusion, we have to disregard the primary symptoms of shock in making a diagnosis of intestinal lesion, and depend upon the symptoms of peritoneal irritation supervening within a few hours, for our diagnosis. If I were asked the symptom of most importance, I should unhesitatingly say, muscular rigidity. Some recent writers lay more stress upon the absence of peristalsis. This is a physical sign with which I am not so familiar as with muscular rigidity, but one that I should think well worth cultivating.

Abdominal pain and tenderness, muscular rigidity and the absence of peristalsis, vomiting and an anxious facial expression should lead us to a correct diagnosis early in the case. That abdominal contusions may be immediately followed by severe abdominal pain and tenderness, without intestinal lesion, is illustrated in the following case:

A strong muscular man was hit in the epigastric region by the end of a board, the other end being run over by a traction engine. He nearly fainted; had intense abdominal pain, and was nauseated but did not vomit. Dr. H. G. Farmer saw him within an hour and gave him a half gr. of morphia to relieve the pain. On account of the extreme abdominal tenderness, Dr. Farmer was apprehensive of an intra-abdominal lesion, so had him removed to the hospital for further observation. I saw the patient four hours later, at which time there was much abdominal tenderness, but no true abdominal rigidity, that is when his fear of being injured by the examining hand was overcome; the abdominal wall was perfectly flaccid; his recovery was rapid and he left the hospital after two days.

The prognosis of intestinal rupture after abdominal contusion, is bad; without operation they virtually all die. In the pre-operative days Curtis collected 116 cases, all fatal. Petry's collection of 160 cases gave 93 per cent. mortality with seven per cent. recovery with the formation of abscess and fecal fistula. These are the extremes of the bad and good in old records. Most series gave a mortality of 98 per cent. Since operation has become the accepted method of treating these cases, the mortality has steadily declined, so at the present time most series will show a mortality of not more than 50 per cent. The present mortality in operated cases depends mainly upon the time after the injury that the operation is performed. The earlier the operation the better the prognosis. It is the same here as in other cases of acute peritoneal inva-

sions; if you are going to save your patient the infection must be arrested before the peritoneal damage is too extensive. The main thing is an early diagnosis to be followed by prompt operation. If every practitioner of medicine realized the possibilities of abdominal contusions producing intestinal lesions, and if he felt that it were not possible to save his professional reputation behind the time honored term of "internal injuries," more of these cases would be diagnosed earlier and more would be saved by a timely operation. The majority of cases operated within the first twelve hours will recover. Twenty-five to forty per cent. of those operated in the second twelve hours may get well. After twenty-four hours the mortality rapidly increases to seventy or eighty per cent. So the rule should be to operate just as soon as a diagnosis can be made with reasonable certainty, and if in doubt, operate, if the facilities for a reasonably safe abdominal operation are at hand. In operating, the incision should be so placed as to give easy access to that portion of the abdomen lying beneath the point at which the blow was received. Frequently there will be no surface indications to designate this point, in which case we have to depend upon the testimony of by-standers or what is better, the point of greatest tenderness. Usually a median incision will answer the purpose, either above or below the navel, as the indications point to injury in the upper or lower abdomen. If the operation is done several hours after the receipt of the injury, the perforation is easily found by simply following up the increasing indications of peritonitis. It should rarely be necessary to eviscerate the patient. In neither of two recent cases was it necessary to disturb the bowels to any extent.

The intestinal lesion should be managed in the manner that the experience of the operator and the character of the injury would indicate as the simplest and best. For small blow-outs the purse string suture is adequate—linear tears can be closed with a double row of sutures, care being taken not to angle the gut or encroach upon its lumen.

When the bowel is dangerously bruised or its blood supply jeopardized by injury to the mesentery, resection is the wisest course, followed by end to end anastomoses. The older method of stitching the gut into the incision for a fecal fistula to form should but very rarely have a place in the present-day surgery. Once the injured bowel has been repaired, attention is next given to the existing peritonitis. I can scarcely conceive of a case brought to operation early enough to make it safe to close the abdomen without drainage. My own plan is to sponge out as gently as possible gross foreign material, fecal matter and pus; then to drain the pelvis with a split tube and place a cigarette drain at the site of the injury; there is no flushing, no eviscera-

tion; subsequent treatment is similar to an ordinary case of peritonitis; the Fowler position; the continuous proctoclysis and the withholding of everything by the mouth until the condition of the patient shows that his convalescence is established.

In conclusion I wish to repeat what was said in the beginning of this paper; that subcutaneous intestinal injuries are probably of more frequent occurrence than is generally supposed. No practitioner of medicine is now justified in taking refuge behind that vague term of "intestinal injury," but should make his diagnosis early and definite and should resort to or have resorted to means to repair the damage and thus cure the patient while the possibility of cure is easily within the range of surgery.

The following cases are appended as illustrating the different methods of producing these injuries:

CASE I.—Brakeman; injured by being pinched between the bumpers of two cars. When released fell to the ground; was assisted to his feet and walked several rods to a hack and was driven home. He was cut about the head; the right shoulder injured and he suffered abdominal pain. The wounds of the head were sutured and the shoulder given attention, but nothing was done for the abdominal pain, but to give an opiate. The accident occurred Wednesday; Saturday he began having occasional attacks of vomiting while the abdominal pain continued, except as relieved by hypodermics of morphia. When seen Monday night he presented the picture of a patient suffering from a grave abdominal trouble; pinched and anxious countenance; clammy extremities; a small and rapid pulse; temperature, 101° F. and a distended and tender abdomen. He was removed to the hospital and the abdomen opened, and a rupture in the ileum was found, which evidently was small at first, or possibly was a severe contusion, which ruptured subsequently to adhesions forming to the outer abdominal wall. At any rate the condition found was: ruptured bowel; adhesions to abdominal parieties; abscess formation and obstruction. The patient died twelve hours after operation.

CASE II.—Italian; seen in the hospital in consultation. Two days prior he was struck in the abdomen by a brick thrown at him in a drunken row. He had vomited immediately after the injury and suffered from pain. Seen by his physician the next day, who sent him to the hospital where he was treated with hot stupes and opiates. When seen forty-eight hours after the injury he was plainly suffering from general peritonitis and the opinion expressed that the peritonitis depended upon a ruptured intestine, and operation advised. The diagnosis was not concurred in by the attending physician, so opera-

tion was refused. He died two days later and at the necropsy a ruptured bowel was discovered. The portion of the bowel injured was not given in the mortuary reports.

CASE III.—Daniel D.; boy nine years old; kicked in the lower abdomen by a horse; had intense abdominal pain. Seen by Dr. S. W. Sawyer shortly after the injury, who gave him an opiate. The injury occurred about noon; by four o'clock he was still in great pain; the pulse had become rapid and small, and the abdominal wall very rigid and vomiting was frequent. Dr. Sawyer immediately made arrangements to send him to the hospital in Watertown, where he arrived at nine o'clock the same evening. Examination showed the general condition about as above with the greatest amount of tenderness in the hypogastrum; the skin showed a slight amount of discoloration just below and to the right of the navel. On account of the location of the pain an opinion was expressed that we had to deal with an intraperitoneal rupture of the bladder, but a catheter brought away ten ounces of clear urine. A laparotomy was done as soon as possible and a large rent in the ileum was found, extending from near the mesenteric border to a point opposite the mesentery, involving about a third of the circumference of the bowel. Injury occurred about thirty inches from ileocecal valve. The lower abdomen was filled with fluid fecal matter, blood and the usual products of peritoneal inflammation. The rent was sutured; the peritoneal cavity sprayed out and the abdomen closed except for a drain in the pelvis and one to the sutured intestine. At the end of twenty-four hours he began to do badly; vomiting returned and the abdomen became more distended, though the pulse had improved both in rate and quality. No relief having been obtained by medication and enemas, he was taken back to the operating room forty-eight hours after the first operation, and a loop of bowel just proximal to the injury, stitched into the wound and opened. This enterostomy drained profusely from the first and relieved the situation so that he made a good convalescence, except for the annoyance of the fecal fistula, which was closed six weeks later and he was discharged from the hospital two months after entering, perfectly well.

CASE IV.—Boy eleven years old. This case has an especial interest on account of the cause of the rupture. During the recess hour at school this lad was playing ball with companions of his own age. He was occupying the position of catcher; a high ball was thrown which would apparently pass high over his head. He raised on his toes and reached both hands over his head in an effort to stop the ball; the efforts of the batter however, deflected the ball downward so that it struck the catcher in the abdomen between

the navel and pubis. He nearly fainted as the result of the blow; was carried into the school house, but soon became so nauseated and ill he was assisted across the street to the house of a friend. From there he was taken to his home—an hour later. He was seen by his physician, Dr. Buchanan, during the evening who gave him a hypodermic of morphia to relieve the intense abdominal pain. A telephone message to the doctor the next morning assured him that the boy had rested well during the night, except that he had vomited a few times. At three o'clock that afternoon Dr. Buchanan saw the case a second time and found he was again suffering severe abdominal pain, vomiting frequently, with a rapid pulse, and a temperature of 102° F. The entire abdomen was tender and very rigid, the greatest amount of tenderness being over the right iliac fossa. Dr. Buchanan telephoned me his history and condition and requested that I come prepared to operate. It was nine o'clock that evening when I reached the boy's home. The condition of the boy was about as the doctor had telephoned me in the afternoon. It was clearly a case of general peritonitis, and from the history presumed due to a ruptured bowel. Operation was advised and accepted, though it was explained that the chance for successful issue was not good on account of the lapse of time from the rupture—thirty-two hours. On opening the abdomen a small perforation was found in the ileum about three feet from the ileocecal valve; the perforation was round, about the size of a pencil, with protruding mucous membrane and had occurred directly opposite the mesenteric attachment. The rent was closed and the gross soiling of the peritoneal cavity removed by careful sponging; no extensive flushing was attempted; the abdomen was closed with drainage. The convalescence was somewhat stormy on account of a septic parotitis, which developed about the fifth day. His eventual recovery was good, and he has remained well since the injury.

Discussion.

DR. ROBERT T. MORRIS, New York City: Mr. Chairman and Gentlemen—I will make only two points: First, in regard to rigidity of the abdominal muscles upon which Dr. Gregor placed so much stress. I agree with him that this is an extremely important diagnostic sign, but it requires some strength on the part of the patient to put this splint on the bowel. A rigid abdomen means Nature's splint. Nature wants to protect that area; but the degree of shock may be so great in the early hours of injury of this sort, that the patient is not able to place this splint over his bowel. Therefore, one may be misled by finding in the first hours after a severe abdominal injury no splint upon the bowel. We have to be guided

in that case by other signs. I have been called to several cases in which physicians thought that no very serious injury had occurred because there was no splint upon the bowel. The patient may have had a clear mind notwithstanding the great degree of shock. One case of this sort I remember to have seen recently, where we had apparently an explosive injury. A patient in coasting down a hill on a bicycle struck the breast of a horse that was coming up hill, and two feet of the patient's transverse colon were burst literally wrong side out, yet the patient was believed by the family physician and one consultant to have no serious injury.

The next point I would make is this: Do not do too much to these patients in an operative way shortly after the injury. We may find the mesentery distended with blood, extensive contusion of bowel, and one may not know just where to limit his incision, and the tendency is to do too accurately the mechanical work in sight at the time when the patient is not well prepared to resist this additional attack. In many of these cases we may reserve the operation for a second step, expose the site of injury, if it is not too extensive, if the lacerations or perforations are not too extensive, throw a sheet of Cargile membrane over each opening, and leave the openings to drain toward a central point. If you can put in a wick drain in that area so that it will drain the peritoneal cavity, and not have leakage from the bowel, get in and get out as quickly as you can, treat the patient for shock, it is the thing to do, and subsequently you can do an intestinal operation if you wish. I am stating this as a general rule. There are cases in which we may readily put in a purse string suture and bring to the surface and suture temporarily the opening in the bowel. But this is the chief point I would make: Occupy every moment in conserving the resistance of the patient at this particular time; do as little to him surgically as you can at this time, and you will be surprised how many of these patients will quickly come out of shock if you make drainage, covering the openings small enough with Cargile membrane, leaving them around a central drain, and leaving the subsequent work until a later time.

DR. A. T. BRISTOW, New York City: I would like to say a word or two on two points. In these abdominal injuries it is quite frequently the case that we find absolutely no evidence of injury on inspection of the abdominal wall. I have seen the most serious abdominal injuries without any ecchymosis or contusion or without a scratch, and I would second what Dr. Morris has said about conserving the resistance of the patient. I will briefly cite a case which I had last week.

I was called to see the 3½ year old son of a physician who was run over by an automobile, the car having backed over the child. He was pulseless when I saw him. There was not a scratch on his abdomen; no ecchymosis or mark at all, but some rigidity, and the catheter withdrew blood. He was in a condition of collapse and there was one chance in 50 I would get him off the table alive. The parents were willing to accept the risk of his dying on the table, so he was sent to the operating room and the abdomen opened. No intra-abdominal injury was discovered, but the bladder was found to be torn away from the membranous urethra and shoved upward, carrying the peritoneum with it, so I had to deal with a huge Retzius space that held a pint and a half of blood and urine. The ureters were visible, as well as the ureteral openings, and the orifice of the bladder occupied a superior position as the child lay on the table. I packed the space of Retzius with gauze, and sewed the bladder opening rapidly to the abdominal wall. Strange to relate, that child got well from the primary injury and is in excellent condition. I made an examination of the blood 72 hours after the injury, which showed that the child must have lost nearly 50 per cent. of the blood. The hemoglobin was down to 45 per cent., and the red cells were down to two million and a half. Two drains were placed in the wound, one in the space of Retzius, and one in the bladder, connected with an exhaust apparatus, which keeps both cavities completely dry.

The problem of repair comes later.

I want to emphasize again what Dr. Morris said with regard to the necessity of conserving the resistance of the patient. If I had attempted any form of repair in this case, I would have lost the child. As it is, I am confronted with a difficult surgical problem, but I have a live patient.

DR. EDWIN M. STANTON, Schenectady: One point in regard to the diagnosis which I think has not been sufficiently emphasized, and that is the obliteration of liver dullness which often occurs very early in these cases of rupture of the intestines. We have had only four of these cases, but in all of them obliteration of liver dullness was the first definite sign which we had, aside from the history of injury, and the shock and pain. It is perfectly rational, because most of these ruptured intestines leak gas very promptly, and this gas gravitates to the upper abdomen over the liver.

DR. GILBERT D. GREGOR, Watertown (closing the discussion): With regard to the remarks of Dr. Morris, I tried to make it clear that in the first few hours of nerve shock the patient should not be interfered with; but in shock that is due to hemorrhage, we are justified in taking the risk, but doing just enough to meet the pressing complications.

MATERNAL IMPRESSIONS OR ACCIDENTAL COINCIDENCES—WHICH?

AN ABSTRACT*—WITH A REPORT OF TWO CASES OF MONSTROSITIES.

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THERE are certain malformations of the child in utero that often make delivery difficult. Often embryotomy is necessary. This is usually the case in the treatment of difficult labor with an anencephalic *tœtus* which is classed as being the commonest monstrosity. But common only when compared with double monsters, hydrocephalic *fœtuses*, etc., and we may doubt the rarity of an hydrocephalus as compared with an anencephalus.

Clinical observations seem to bear out the theory that if a pregnant woman receive a mental impression of sufficient intensity that the mental impression received may be the means of arresting the development or causing the deformity of the *fœtus*. All practitioners know or have read of cases in which infants have been born where the markings or deformities, etc., have corresponded in character to certain sights which have been said to have made a strong and lasting impression on the mind of the mother during the earlier period of uterogestation.

It is obvious that strong emotions have and will continue to most powerfully affect the functions of most of the important organs in the human body. Such emotions may derange or stimulate certain organs which, however, are connected with the brain by nerves. To the contrary, however, it must be admitted that the nervous system, and even the blood supply, of the mother and the *fœtus* are distinctly separate. Yet, the pages of testimony, if true, which have been recorded would seem to justify the assertion that maternal emotions of sufficient intensity may be the means of arresting or rendering abnormal the development of the *fœtus*, and if this is true, then the power and range of the human mind is exemplified.

Dr. W. A. Hammond of New York,¹ in a paper upon the "Influence of the Maternal Mind," etc., says: "The chances of the instances . . . being due to coincidence are infinitesimally small, and . . . I cannot, nor do I think any other person can, no matter how logical may be his mind, reason fairly against the connection of cause and effect in such cases. The correctness of the facts can only be questioned; if these be accepted, the probabilities are thousands of millions to one that the relation between the phenomena is direct." Professor Dalton² says: "There is now little room for doubt that various deformities and deficiencies of the *fœtus*, conformably to the popular belief do

really originate in certain cases from nervous impressions, such as disgust, fear, or anger, experienced by the mother." This belief is based on observations both in the human race and the lower animals and instances of transmission have been observed in both.

The advocates of this theory adduce one of their most reliable arguments from the Scriptures (Gen. xxx, 37-39): "Jacob took him rods of green poplar, and of the hazel and chestnut tree; . . . And he set the rods which he had piled before the flocks in the gutters in the watering-trough . . . that they should conceive when they came to drink. And the flocks conceived . . . and brought forth cattle ring-streaked, speckled and spotted." It would seem that there must be some truth for this almost universal opinion, which is centuries old, of maternal impression, especially when the subject under discussion is one of observation.

If the development of the exterior part of the *fœtus* may be affected by maternal emotions, may not the proper development and adjustment of the complex and delicate parts of the brain be also affected, and therefore give rise to idiocy? Commenting on this point Dr. Sequin³ says: "Impressions will sometimes reach the *fœtus* in its recess, cut off its legs or arms, or inflict large flesh wounds before birth . . . from which we surmise that idiocy holds unknown though certain relations to maternal impressions as modifications to placental nutrition." How interesting is the assertion that abnormalities of structure may be hereditary and that the malformations may be of the internal organs as well as of the external parts. As stated before, instances of transmission have been observed not only in the lower animals but are now and then seen in the human race.

At the present time, however, authors, practitioners and teachers differ. It has always been extremely difficult to demonstrate that any deformity or mark or lack of development in the child was due to a maternal impression received before its birth, inasmuch as there seems to be at least one unanswerable argument in that we find the nervous system of the mother and *fœtus* has a distinctly separate existence. Barker⁴ quotes freely from physiologists to show that the weight of authority is in favor of the doctrine that maternal impressions may affect the development of the *fœtus*. He says: "When, in the early weeks, structural development is proceeding at no tardy rate, an interference to nutrition of the mother cannot but impress the *fœtus* detrimentally, and the organ interfered with would be that one in the condition of the most active development or that which could less bear any arrest, however transient, with impunity." He further says: "Then, too, although no nervous connection has been demonstrated to exist between the mother and the *fœtus*, yet the latter possesses nerves; and alterations of the nutrient power

* American Text Book of Obstetrics: Difficult Labor. Herman. American System of Obstetrics, Vol. II, Hirst.

of the mother cannot but act on the nerves that are governing, though it may be only to a slight extent, the growth of the fœtus itself."

Opposing this theory is an able article written by J. G. Fischer and the following are a few of his conclusions epitomized: That traditional superstition has perpetuated the notion, and that the medical profession is in no considerable degree responsible for its continuance; that intense emotions and apprehensions are experienced, and malformations are expected by many gestating women, yet the abnormal births are extremely rare; that there is no law in the alleged result, and that the occasional apparent relation of cause and effect is due to accidental coincidences.

Another argument against the theory of maternal impression is that the assumed causes are said to have operated upon the embryo subsequently to the period for the evolution of the part found to be the site of the malformation, which implies a retro-formative power as well as a formative process. In other words, if a child is born with a deformity or mark, the parents, especially the mother, in many cases, whether from being coached or not, whether through ignorance or firm belief, will remember some impression similar to the marking of the child and will place the reception of that impression at a certain time, when, as a matter of fact, the impression was received, or said to have been received, a considerable time after or before the period when, according to the study of embryology, a certain part, the site of this marking, had already been developed.

Yet, granting the above to be true, if an impression of sufficient intensity be received by the mother before the period of development of a certain part of the fœtus may not this impression have been so intense as to be indelibly written in the mother's mind, and, at the period of development of this certain part or parts, exert a bad influence on the proper formation of the fœtus. It certainly seems that there is more than coincidence in the fact of fright and shock and the subsequent malformation or marking of the fœtus. The "elephant man" of England, and the "turtle-man" exhibited in the United States, and other instances, are certainly evidences of this statement.

Case after case has been brought forward that seem to prove the position assumed by those for and against the doctrine of maternal impressions affecting the growth, form, and character of the fœtus and though many may regard the relation of cause and effect as largely an accidental coincidence, we must, however, bear in mind the fact that very profound emotion can and does in some unknown manner influence the growth and development of the unborn babe.

In support of the theory of mental impression, I wish to report two cases of monstrosities born to the same mother within a year, a set of orig-

inal photographs, front and back views, and a concise history of the causes which appeal to me as having had a direct influence upon the malformations that these two cases present.



Front View (1 B) Male.

CASE I.—On the 21st of December, 1910, I was summoned at 5.30 P. M. to attend Mrs. C. J., aged 17 years, in her first labor. On arriving at the house I found the pains very severe but far apart; the os was dilated to the size of a ten-cent piece. It was impossible to detect the presentation. The patient's home being nearby, I returned to my office after leaving instructions for the nurse to send for me when the pains became more frequent. At about 7.45 P. M. I was called and on arriving, found that the membranes had ruptured and upon examination, I found "something" presenting. This "something" felt to my fingers like a placenta and I certainly must confess I was "up a tree" for a while. As labor progressed I made another examination and finally decided that the head was presenting, and at 8.30 P. M. the head was born. It was anything but a pretty head. The shoulders gave me some trouble, but I succeeded in delivering them without resorting to embryotomy. The rest of the delivery was easy. No



Front View (1 A) Female.



Back View (1 A) Female.

instruments were used. The monstrosity, a female, weighed close to ten pounds. The arms were over-developed. Shoulders broad. The head was placed down between the shoulders giving a "no neck" appearance. The frontal bone was absent. The eyes were prominent and open; nose broad and flat; ears large and practically resting upon the shoulders; mouth large, open, and tongue protruding. The face was cyanotic. The physiognomy was of frog-like appearance. (See cut 1-a, front view, made from original photograph.) The parietal and occipital bones were missing and the defect also involved a goodly portion of the spine. A vascular mass laid on the exposed base of the skull and consisted of connective tissue and vessels. It represented the cerebral meninges and was continuous below with the spinal meninges. That part of the mass which laid on the exposed base of the skull resembled the placenta in appearance. The monstrosity was born dead and I placed the time of its death at two days before birth, as that was the last time the mother could remember of having felt life. (See cut 1-a, back view, made from original photograph.) After delivery I waited a reasonable length of time before attempting to deliver the placenta, but this was not accomplished until 1 A. M., and not until after I called in Dr. Carroll B. Bacon, of Waterloo, N. Y., to administer an anesthetic. This being done, I broke up the placenta adhesions and delivered the placenta intact. The mother made a rapid and complete recovery.



Back View (2 B) Male.

CASE II.—On November 29, 1911, I was called at 6 P. M. to attend Mrs. C. J., then 18 years old (who gave birth to the monstrosity mentioned above), in her second labor. The time of her confinement had previously been placed by me for the week of January 12, 1912. On arriving at the house, I found the pains severe but far apart. The same as in her first labor. No presentation could be detected. There was no dilatation. After leaving the necessary instructions I returned to my office. At 4 A. M. the following morning, November 30th, I was again called and upon my arrival found the membranes presenting, the dilatation being complete. I was still unable to detect the presentation and decided that this was due to an excessive quantity of liquor amnii. The pains became more severe and very close together and I then ruptured the membranes. The quantity of liquor amnii that poured out was astonishing and it kept pouring out until labor was practically completed. After the patient had been relieved of a large quantity of the amniotic fluid I made further examinations and was finally rewarded in detecting the eyes, nose, and mouth, and I also felt something similar to a placenta. (Same as in the first case.) Labor proceeded and the birth of the head and shoulders gave some trouble, but, as in the first case, I was not obliged to use instruments or resort to embryotomy. This monstrosity, a male, weighed about six pounds. The arms were somewhat over-developed; head down between the shoulders, but not to such an extent as in the case reported above; frontal bone absent; eyes prominent and open; ears large and nearly in contact with shoulders; nose broad and flat; mouth large, and tongue protruding and skin on body cracked open in various places. Face cyanotic but not as much so as in first case. Physiognomy was that similar to a frog. (See cut 2-b, front view, made from original photograph.) The parietal and occipital bones were absent and there was a vascular mass, of placental appearance, lying on the exposed base of the skull, but in this case it was not continuous with the spinal meninges. The skin, especially about the legs, was cracked open. This monstrosity, fortunately, was practically dead when born, for although the heart acted for a few seconds, there was no expansion of the lungs and artificial respiration gave no result. (See cut 2-b, back view, made from original photograph.) I had very little trouble with the delivery of the placenta and was home at 7.30 A. M. The mother again made a rapid and complete recovery.

History.—The mother was 17 years old at the time of her first labor and 18 years old at the time of her second labor. Her mother died of Bright's disease three years ago. Her father, one sister and two brothers are living and in good health. The sister is tongue-tied and one brother not over bright. The mother has a very

receptive brain, believing anything she hears or sees, and therefore easily impressed. This, however, I consider due to her bringing up and the lack of opportunity to obtain an ordinary education. The father, now 24 years of age, is of the same mental calibre as the mother. His parents, a brother and a sister, are living and in good health. As to his mother I could find out nothing definite, but his father may be classed as ignorant. When Mrs. J. was about two months pregnant, first time, her husband severely frightened her. The husband has a chest expansion of six and one-half inches and also has the knack of elevating his shoulders, which are very broad, until they touch his ears or the upper part of the back of his head. When his shoulders are elevated, his head sunk between them, and his chest expanded, he looks as if he had a terrible deformity. At the time mentioned, about the second month of the first pregnancy, the husband, in a spirit of fun, suddenly walked into the room where his wife and her father-in-law were sitting, but, before doing this he pulled his derby hat down over the back of his head, removed his glasses and opened wide his eyes and mouth, expanded his chest, elevated his shoulders and sunk his head between them, and then confronted his wife. She as well as her father-in-law were severely frightened at the time. While tying the cord at the birth of the first monstrosity the mother deliberately raised herself from the bed and looked at the mal-formed child. After the delivery of her second monstrosity, the husband, before I could prevent him, as deliberately showed her this second abnormal infant.

Some may doubt the ability of the husband to assume the dwarf character which I have stated above, yet I have since seen, on the voluntary part of the husband, this same character impersonated by him and only several years ago the husband appeared on the stage in this village in the characterization of a dwarf in "The Lilliputians," given by the local Methodist-Episcopal church. Another physician besides myself, the parents of the monstrosities, the photographer, and the undertaker are pretty good witnesses to the fact that the two monstrosities were born, photographed, and buried. This I mention because I have read in different works that reports of cases like I have recently come in contact with are many times reported from sources unworthy of belief.

These two monstrosities I have classified as anomalies of acrania and anencephalus. Assuming this classification to be correct, this question naturally arises: Are these two cases accidental coincidences or are they due to a maternal impression?

I contend, from the history I have been able to gather, that the fright innocently occasioned by the husband, representing the character that he did, was responsible for the malformation of the first child and that the sight of the first mon-

strosity together with the remembrance of that previous fright and with the additional worry of whether or not her next babe was to be a terrible looking thing, was responsible for the abnormal condition of her second child; and should this woman become pregnant again would not her accoucheur expect to assist into the world another monstrosity!

Assuming that the theory of accidental coincidences is far from being right, and that the doctrine of mental impression is not fully established, is it not, however, the duty of the physician to advise the pregnant woman to avoid unusual, frightful, and freakish sights; to avoid undue excitement that her mind may be in a state of tranquillity and repose that her offspring may be moulded in the image of the Creator.

REFERENCES.

1. *Quarterly Journal of Psychological Medicine.*
2. *Human Physiology.*
3. *Idiocy and its Treatment, etc.,* N. Y., 1866.
4. *Paper.* American Gynecological Society, 1886.

* Read at the Annual Meeting of the Medical Society of the County of Seneca, at Romulus, N. Y., October 10, 1912.

ECTOPIC GESTATION.*

By I. M. SLINGERLAND, M.D.,

FAYETTEVILLE.

M. B., age 27, about 5 feet 2 inches, spare build. Not very robust but never much sick. Married two years, no children. Has never been very regular. Sometimes skipping two months.

Last period the latter part of May, missed June period. Soon after began to have daily, or several days apart, vague pains in lower abdomen.

Fourth of July week was in water bathing for nearly an hour. After that pains were more frequent and more severe, although none were very hard.

On July 14 came to my office. On examination cervix much enlarged and body of uterus hard and tender, so much so I could not make a complete examination. In right ileac region I could make out by palpation and percussion a slight swelling. I could not say whether she was pregnant as she had no nausea, enlarged breasts, discoloration about nipple nor any other symptom showing pregnancy except missed period. I thought she might possibly have gotten those parts congested by being in the water so near the time for her menstruation. July 18, 23, 24 I visited her at her home and found her flowing a little (some small clots and stringy mucus) with occasional pains in right ileac region. The conditions on examination did not seem differ-

ent than first examination, although there was a slight bloating of bowels some days and tenderness all the time. July 24, said she felt well, no tenderness, pain or any other bad symptoms. She continued that way until July 31 when she sent for some medicine saying she had a slight return of the pain.

August 3 she sent for me in haste as she had such severe pains. I saw her about 3.30 P. M., and on examination I found a distinct mass in vagina very tender and painful. She had been vomiting and was more or less nauseated. I diagnosed extra uterine pregnancy with rupture. I advised her to go to the hospital and by 7 P. M. she was there in bed. I took her in my auto. At the hospital Dr. Wallace confirmed the diagnosis. The next morning at 10 she was operated on and the diagnosis clinched. About a quart of blood was removed. She recovered so rapidly she went home in 9 days. After being home a week she developed an abscess in the wound under the straps. She sent for me, but it had broken just before I arrived. I removed the straps, cleaned out abscess cavity, which contained about 4 ounces of colon bacillus pus. Now she is perfectly well. This was my first case in 28 years. The speedy recovery shows what asepsis and operating at the right time can do.

NOTICE.

To the Readers of the NEW YORK STATE JOURNAL OF MEDICINE:

About six years ago the writer began to use vaccines in the treatment of typhoid fever. Since that time he has thus treated more than one hundred cases and has obtained numerous articles upon the same subject written by physicians in various parts of the world. It seems possible, however, that some may have escaped notice. He also realizes that many of the profession may have treated some cases without reporting them. A paper upon the subject is now in the course of preparation. In this it is earnestly desired to incorporate reports from a large number of cases good, bad, and otherwise. He accordingly makes the following request to the readers of this journal:

Will anyone who has used vaccines in the treatment of typhoid fever, whether but one case or more, kindly communicate to him that fact accompanied by name and address of the reporter. If the results have already been reported, a note of the journal in which they appeared will be sufficient. If they have not been reported, a short blank form will be sent to the physician to be filled out. Due credit will be given in the article to each person making a report. If any physician happens to know of other confrères who have any such cases, it will be appreciated if he sends their names, as they may not happen to read this note. It is hoped that by this means a sufficient number of cases may be collected to somewhat definitely settle the now mooted question whether vaccines are or are not of benefit in typhoid therapy.

Reports of cases will be accepted at any time in the future but preferably by November or December of the present year.

Kindly communicate with Dr. W. H. Watters, Director of the Department of Pathology and Bacteriology, Evans Institute for Clinical Research, Boston, Mass.

* Read before the Onondaga Medical Society, at Syracuse, September 26, 1911.

The Medical Society of the State of New York

DISTRICT BRANCHES

SEVENTH DISTRICT BRANCH.

ANNUAL MEETING AT CORNING, OCTOBER 10, 1912.

The meeting was called to order in the court house by the president, Dr. H. B. Smith. There were about sixty-five physicians present.

Dr. Smith also read a paper entitled, "The Importance of Clinical Examinations as Well as Laboratory Findings in making an Accurate Diagnosis."

This paper showed much thought and suggested many things worth considering by the careful physician.

The first regular paper on the program was read by Dr. LaRue Colgrove of Elmira, "The Cancer Problem."

This paper was discussed by Drs. W. Skinner of Geneva, R. T. Morris of New York and F. W. Ross of Elmira.

The third paper "Fractured Femur with New Apparatus for Fraction," was read by Dr. Edgar Sturges of Scranton, Pa., discussed by Drs. R. T. Morris and N. R. Townsend of New York.

The fourth paper "Prevention of Joint Deformities and Cure of Crippled Arms and Legs," by Dr. W. B. Jones of Rochester was not discussed.

The fifth paper "Inflammation of Nasal Accessory Sinuses," by Dr. T. Joseph O'Connell was discussed by Drs. N. E. Bowen and Clapper.

The meeting then adjourned for luncheon at the Dickenson House.

After luncheon the meeting was called to order at 2.30 P. M. Minutes of the previous meeting were read and approved.

An invitation was received from Dr. W. T. Shanahan of Sonyea asking the branch to hold its next meeting at that place in 1913.

Moved, seconded and carried that the next annual meeting be held at Sonyea. Moved, seconded and carried that a vote be cast by the secretary for Dr. Shanahan to act as president for the ensuing year. The vote was cast and Dr. Shanahan was declared unanimously elected.

Moved, seconded and carried that Dr. Bowen act as first vice-president for the ensuing year. A vote was cast by the secretary and Dr. Bowen was declared duly elected.

Moved, seconded and carried that Dr. Myers act as secretary for the ensuing year. The vote was cast and Dr. Myers was declared duly elected.

Moved, seconded and carried that Dr. Knickerbocker of Geneva act as treasurer, and that a vote be cast by the secretary. The vote was cast and Dr. Knickerbocker was declared elected.

Moved, seconded and carried that a vote of thanks be rendered the profession of Corning, for the able and magnificent way in which they had entertained the attending physicians.

The following amendment to the By-Laws proposed at the last annual meeting were read and on motion duly seconded were unanimously adopted.

Amend Section 3, Chapter 11, by striking out the words, "On January 1st" of each year and substituting the words at the close of the Annual Meeting of the Medical Society of the State of New York.

After the business meeting, the sixth paper "Means and Methods of Eliminating the Death Rate from Surgical Operations," by Dr. Marshall Clinton of Buffalo, was discussed by Drs. R. G. Loop and R. T. Morris.

The seventh paper, "Loose Abdominal Vicera," by Robert Tuttle Morris of New York was discussed by Drs. W. W. Skinner, W. E. Bowen and R. M. Swan, and closed by Dr. Morris.

The eighth paper, "Ruptured Tubal Pregnancies," by Dr. W. W. Skinner of Geneva was discussed by Drs. G. M. Case, T. Morris and closed by Dr. Skinner.

The ninth paper, "The Diagnostic Value of Blood Examinations," by Dr. John Mumford Swan of Rochester was discussed by Drs. J. C. Fisher and R. T. Morris and closed by Dr. Swan.

The tenth and last paper read "The Prevention of Insanity," by Dr. Chester Waterman of Willard State Hospital, was discussed by Dr. R. T. Morris.

COUNTY SOCIETIES.

MEDICAL SOCIETY OF THE COUNTY OF ERIE.

REGULAR MEETING AT BUFFALO, OCTOBER 21, 1912.

BUSINESS SESSION.

The President, Dr. Thomas H. McKee, presided.

Secretary Gram read the minutes of the last meeting which was held June 17th, 1912, also the minutes of the Council meetings of October 7th and October 21st, 1912, all of which were duly approved.

On account of removal from the city, Drs. F. Frisch and R. A. Edson tendered their resignations which were accepted.

Dr. Charles A. Wall, chairman of the Committee on Membership, presented applications of twelve new members all of whom were duly elected.

Dr. Hopkins, chairman of the Committee on Public Health, presented a report for his committee and submitted a draft of a letter addressed to the District Attorney in reference to school ventilation which, on motion of Dr. Wall, was approved and the committee directed to refer the matter to the District Attorney.

Dr. Bonnar, chairman of the Board of Censors, submitted a lengthy report on behalf of the Board, in which he stated that Matthew Stark, a barber of Lackawanna, N. Y., had been fined \$25 for cupping; another man named Reeves was fined \$50 for illegally practicing medicine in the office of Dr. Hughson, No. 6 South Division Street; \$50 had also been recovered in the Treskow case, the fine having been imposed as far back as 1910; the Board was also instrumental in bringing about several other indictments for criminal malpractice. Dr. Bonnar stated that Attorney Charles A. Doane, who, for several years had acted as counsel for the Society, had tendered his resignation and that Attorney Alfred L. Harrison had been appointed in his place. Report was adopted and the thanks of the Society extended to the Board of Censors.

Dr. William H. Thornton, chairman of the Special Committee on Collections of Accounts, reported progress and asked for further time which, on motion, was granted.

On motion of Dr. Lytle, the details for the conduct of the annual election was referred to the Council with power.

Dr. Woodruff brought up the question of pure water for the city, and after some discussion in which several members participated, it was moved by Dr. Thornton that Dr. Henry R. Hopkins, chairman of the Committee on Public Health, be elected to attend the joint meeting of the Great Lakes International Pure Water Association and the National Association for Preventing the Pollution of Rivers and Waterways to be held in Cleveland, Ohio, October 23rd and 24th, 1912, at the expense of the Society. Motion was carried.

President McKee then called for nominations for the various offices to be filled by election at the annual meeting to be held in December, and nominations were entertained as follows: For President, J. F. Whitwell; First Vice-President, John V. Woodruff; Second Vice-Presidents, Arthur W. Hurd and Franklin W. Barrows; Secretary, Franklin C. Gram; Treasurer, Albert T. Lytle; Members of the Board of Censors, Drs. Bonnar, Fronczak, Bennett, Irving W. Potter, Hendee and A. D. Carpenter; chairman, Committee on Legislation, F. Park Lewis; chairman, Committee on Public Health, Henry R. Hopkins; chairman, Committee on Membership George J. Eckel and Harry Mead. Delegates to the State Society, of which five are to be elected, William H. Thornton, Arthur C. Schaefer, Charles A. Wall,

S. A. Dunham, Thomas H. McKee, E. L. Frost, J. V. Woodruff, B. Cohen, George F. Cott and Cyrus S. Siegfried.

At the evening session, Dr. Hartwig read a memorial on the death of Dr. Ludwig Schroeter.

On motion of Dr. Crego, the president was empowered to appoint fifty delegates to represent the Society at the meeting of the Central New York Medical Association to be held in Batavist, October 24th, 1912.

SCIENTIFIC SESSION.

"Some Considerations in the Treatment of Constipation," D. C. McKenney, M.D., Buffalo.

"Gynecology of Accident and Injury," James E. King, M.D., Buffalo.

"The Pituitary Body," illustrated with lantern slides, Roswell Park, M. D., Buffalo.

Each of these papers elicited interesting discussions at the close of which a fine collation was served.

MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

ANNUAL MEETING, NEW YORK CITY, NOVEMBER 25, 1912.

The one hundred and seventh annual meeting of the Medical Society of the County of New York was held at the New York Academy of Medicine Monday evening, November the twenty-fifth. The meeting was well attended, there being over four hundred present. As usual, the program was devoted, in large part, to the receiving of reports of the officers and committees, and the election of officers, censors and delegates.

The report of the Treasurer is as follows:

SUMMARY OF ACCOUNTS FOR THE YEAR ENDING NOVEMBER 20, 1912.
INCOME AND EXPENDITURE ACCOUNT.

Receipts.

Balance on hand November 20, 1911	\$ 4,673.98
Dues from Members	\$13,865.00
Initiation Fees	888.00
Fines for illegal practice	4,100.00
Milk Commission	6,292.28
Miscellaneous, Duplicate Certificate .....	.50
	<u>25,145.78</u>
	\$29,819.70

Disbursements.

State Assessment, 1909 (arrears). \$	6.00
" " 1910 "	12.00
" " 1911 "	624.00
" " 1912	6,678.00
Services and Disbursements of Counsel	5,745.66
Services and Disbursements of Milk Commission	5,894.84
Services and Disbursements of Secretary	463.98
Services and Disbursements of Treasurer	249.50
Printing and Engrossing	1,503.06
Clerical Services and Supplies ...	1,516.13
Rent of Academy	440.00
Collations	600.00
Special Committee Expenses	505.24
Delegates' Expenses	310.00
Bond for Treasurer	15.00
Funeral Notices	34.40
Initiation fees refunded	32.00
Legislative Information	75.00
Miscellaneous	29.00
	<u>\$24,733.81</u>
Amount deposited in Irving Savings Bank	2,000.00
Balance on hand November 20, 1912	3,085.95
	<u>\$29,819.76</u>

CHARLES H. RICHARDSON, TREASURER, IN ACCOUNT WITH THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

BALANCE SHEET FOR THE YEAR 1911-1912.

Liabilities.

Balance Income and Expenditure Account...	\$ 3,085.95
On Deposit in Union Square Savings Bank, November, 1911	2,143.68
On Deposit in Union Dime Savings Bank, November, 1911	2,629.35
On Deposit in German Savings Bank, November, 1911	2,700.42
Amount transferred from Income and Expenditure Account to permanent fund	2,000.00
Interest	305.67
Union Square Savings Bank....	\$ 75.66
Union Dime Savings Bank.....	92.82
German Savings Bank.....	102.19
Irving Savings Bank.....	35.00
	<u>\$12,865.07</u>

Assets.

Cash in Lincoln National Bank	\$3,085.95
Cash in Irving Savings Bank	2,035.00
Cash in German Savings Bank	2,802.61
Cash in Union Dime Savings Bank	2,722.17
Cash in Union Square Savings Bank	2,219.34
	<u>\$12,865.07</u>

New York, November 22, 1912.

The foregoing accounts, together with the vouchers, have been examined and found correct.

(S'igned) { FLOYD M. CRANDALL
WARD B. HOAG
GEORGE W. KOSMAK
Committee on Audit.

The report of the Board of Censors, read by its secretary, Dr. H. Seymour Houghton, showed an unusually busy year, and the interest of the Censors in their work was shown by the fact that only two members had been absent at one meeting each.

The report of the Counsel, Mr. Almuth C. Vandiver, was of great interest, but the report is too lengthy to give more than an outline of the work accomplished:

One Paul Schmidt sued the Society, and obtained a verdict, for malicious prosecution. The Society appealed, and the Appellate Division rendered a unanimous opinion that Schmidt had no cause for action and the complaint should have been dismissed by the Trial Justice.

The work of the Counsel's office has been larger than ever in answering many inquiries, investigation of complaints, prosecution of cases, one case requiring attendance of the Counsel as far as Wilmington, Delaware. The work has been done with the co-operation of the District Attorney's office, the Police Department, and United States Postal authorities. The fines collected have been \$4,100.00.

The report of the Committee on Membership was read by its chairman, Dr. Joseph B. Bissell; the applications of 107 physicians were investigated and reported upon during the year.

Dr. Linsley R. Williams, of the Public Health Committee, stated that the most important matter considered by them was the Department of Health's supervision of contagious diseases.

Dr. Floyd M. Crandall, for the Committee on Audit, reported the accounts as rendered by the treasurer correct, and congratulated the Society on the economical and perfect management of this most important part of its work.

Dr. E. Eliot Harris, chairman of the Committee on Legislation, reported that there had been introduced 2,859 bills, which had been amended so as to raise the printed number to 3,527, of which 553 were enacted as laws.

The report of the Milk Commission was made by Dr. Rowland G. Freeman, its secretary. The work has increased greatly, and there are now 23 farms under supervision; the income of the commission for the year was \$6,503.15, all of which is spent in its work. The co-operation of all physicians is asked in bringing this important work before the public.

The report of the Special Committee on New Members was read by Dr. Frank S. Fielder.

Dr. Rosalie S. Morton, chairman of the Public Health Education Committee, reported that twelve lectures were given, with an average attendance of 500, a total of 6,000.

The Committee on Hospital and Dispensary Abuse, Dr. William S. Thomas, chairman, gave a most interesting report of its work, which will come up before the Society at its stated meeting in February.

The committee on the question of the certification of pharmacies, Dr. Walter A. Bastedo, chairman, reported adversely.

The annual report of the Comitia Minora was read by the secretary. There were eight stated and four special meetings of the comitia, and eight stated meetings of the society; the attendance of the society meetings totaled 1,765, an average of 220. The membership had changed as follows:

Membership reported last year	2,403
Joined during the year	129
Total	2,532
Loss by death	25
" " resignation	14
" " transfer	7
" " non-payment of dues	17
Total	63
Present membership	2,469

Net increase in membership

It is interesting to note the number of members who have served the society as officers, delegates, on committees, and in the scientific work. They are as follows:

The Comitia Minora	12
Committee on Membership	5
" " New Members	6
" " Public Health	3
" " Audit	3
" " Legislation	10
Milk Commission	12
Public Health Education Committee	34
Committee on Hospital and Dispensary Abuse	15
Sub-Committee on Hospital and Dispensary Abuse	5
Delegates to the Medical Society of the State of New York	35
Committee on the Certification of Pharmacies	10
" " Post-Graduate Medical Instruction	5
" " to confer with the New York Branch of the American Pharmaceutical Association	6
Committee to draft resolutions on the death of Dr. S. Oakley Vander Poel	3
Tellers, 106th Annual Meeting	6
Total	170

SCIENTIFIC WORK.

Readers of Papers	17
Discussors of same	41

Total of those who have served the Society during the year

Then followed the scientific session, the first paper by Dr. Henry Koplik, "Pyloric Stenosis in Infancy," discussion by Drs. Henry D. Chapin, A. A. Berg, Howard Lilienthal, and others; the second paper by Dr. Fred H. Albee, subject, "Bone Transplantation in Pott's Disease, Club Foot, and Ununited Fractures in Children," illustrated by lantern. Discussion by Drs. Robert E. Soule, Sidney A. Twinch, and others.

As the hour was late Dr. Matthias Nicoll, Jr., read his paper by title on "The Present Status of So-called Inculsion Bodies in Scarlet Fever as an Aid in Diagnosis."

The tellers reported the election of the following officers, censors and delegates:

President, Brooks H. Wells; First Vice-President, T. Passmore Berens; Second Vice-President, Howard Lilienthal; Secretary, John Van Doren Young; Assistant Secretary, J. Milton Mabbott; Treasurer, Charles H. Richardson. Censors—David Bovaird, Jr., Joseph B. Bissell, John J. MacPhee. Delegates to the Medical Society of the State of New York—Wendell C. Phillips, Egbert Le Fevre, H. Seymour Houghton, Charles H. Richardson, John J. MacPhee, T. Passmore Berens, Walter Lester Carr, Floyd M. Crandall, E. Eliot Harris, Howard Lilienthal, William L. Culbert, Rosalie S. Morton, Samuel Lloyd, Irving D. Steinhart, Henry S. Stark, Robert L. Loughran, Charles Herrman.

MEDICAL SOCIETY OF THE COUNTY OF ALBANY.

REGULAR MEETING AT ALBANY, NOVEMBER 20TH, 1912.

SCIENTIFIC PROGRAM.

The Treatment of Exophthalmic Goitre with High Frequency Currents, William J. Lewi, M. D. The Treatment of Uric Acid Diathesis by Electricity, E. A. Bartlett, M. D. Electro Diagnosis, J. Montgomery Mosher, M. D. Stereoscopic Radiography, with Lantern Slide Demonstration, John M. Barry, M. D.

MEDICAL SOCIETY OF THE COUNTY OF CLINTON.

ANNUAL MEETING AT PLATTSBURG, NOVEMBER 19TH, 1912.

The following officers were elected: President, Myron D. Briggs, Champlain; Vice-President, Herbert S. McCasland, Saranac; Secretary, Thomas A. Rogers, Plattsburg. Censors—J. J. Robinson, Plattsburg; A. W. Fairbank, Chazy, and G. E. Letourneau, Rouses Point. Delegate to State Society, L. G. Barton, Willsboro. Alternate—W. C. Thompson, Plattsburg.

A resolution was passed recommending the establishment of a tri-county hospital for the counties of Clinton, Franklin, and Essex, as it was thought that a more efficient and more economical administration of such a hospital would be possible, on account of the small population of these counties, than having a small separate hospital in each county.

SCIENTIFIC SESSION.

Surgical Aspects of Chronic Obstructions of the Large Intestines, C. D. Silver, M. D., Plattsburg. The Thyroid State, Leo F. Schiff, M. D., Plattsburg. Congenital Cataract, T. A. Rogers, M. D., Plattsburg.

MEDICAL SOCIETY OF THE COUNTY OF SENECA.

ANNUAL MEETING AT ROMULUS, OCTOBER 10, 1912.

BUSINESS SESSION.

The following officers were elected for the ensuing year: President, James E. Medden, Seneca Falls; Vice-President, Lewis Arthur Gould, Interlaken; Secretary, Edwin P. McWayne, Fayette; Treasurer, Thomas F. Cole, Romulus. Censors—C. S. Barnes, Ovid; J. F. Crosby, Seneca Falls; J. S. Carman, Lodi. Delegate to State Society, R. Knight, Seneca Falls; Alternate, A. Letellier, Seneca Falls.

In the Scientific Sessions, papers were read by Drs. W. L. Wallace and C. E. Coon of Syracuse, and Dr. Lester W. Bellows, Waterloo.

ONONDAGA MEDICAL SOCIETY.

REGULAR MEETING, AT SYRACUSE, SEPTEMBER 24, 1912.
SCIENTIFIC SESSION.

"Aubumenuria not Necessary for a Diagnosis of Brights' Disease," Nelson Wilbur, M.D., Fayetteville.

"X-ray in the Diagnosis of Stomach Diseases, Lantern Demonstration," I. Harris Levy, M.D., Syracuse.

"Modern Methods in Diagnosis and Treatment of Gastric and Duodenal Ulcers," Charles D. Post, M.D., Syracuse.

"Surgery of the Stomach," Frederick Flaherty, M.D., Syracuse.

MEDICAL SOCIETY OF THE COUNTY OF SCHENECTADY.

REGULAR MEETING, AT SCHENECTADY, SEPTEMBER 17, 1912.

SCIENTIFIC SESSION.

"Syphilis of the Cord, with Report of Case," Edward S. Vass, M.D., Schenectady.

"Eclampsia," Calvin B. Witter, M.D., Schenectady.

MEDICAL SOCIETY OF THE COUNTY OF CHEMUNG.

REGULAR MEETING, AT ELMIRA, SEPTEMBER 17, 1912.

SCIENTIFIC SESSION.

"The New York Health Department," Anna M. Stewart, M.D., Elmira.

"Treatment of Inoperable Carcinoma," Charles G. R. Jennings, M.D., Elmira.

"Forms of Refractive Error," Russell B. Lynn, M.D., Elmira.

MEDICAL SOCIETY OF THE COUNTY OF STEUBEN.

SEMI-ANNUAL MEETING, AT HORNELL, OCTOBER 8, 1912.

SCIENTIFIC PROGRAM.

Vice-President's Address, John A. Conway, M.D., Hornell.

"Activities of the Bacillus Coli Communis," Ross G. Loop, M.D., Elmira.

"History of a Case of Uterine Carcinoma in a Woman Aged 35, with Complication, Treatment, etc.," A. E. Richmond, M.D., Wayland.

"Treatment of Pnumonia," Chas. F. Neider, Geneva.

"Report of a Case of Pelagra," F. C. Robbins, M.D., Hornell.

"Extra Uterine Pregnancy with Report of Five Cases," H. P. Jack, M.D., Hornell.

"The Work of the County Laboratory," W. E. Lundblad, M.D., Corning.

MEDICAL SOCIETY OF THE COUNTY OF ONEIDA.

REGULAR MEETING, AT UTICA, OCTOBER 8, 1912.

SCIENTIFLC SESSION.

"The Relief of Nasal Obstruction by Orthodontia," William H. Haskins, M.D., New York.

"The Significance of Cardial Irregularity from the Therapeutic Standpoint," E. R. Evans, M.D., Utica.

BOOKS RECEIVED.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

A MANUAL OF AUSCULTATION AND PERCUSSION, EMBRACING THE PHYSICAL DIAGNOSIS OF DISEASES OF THE LUNGS AND HEART, AND OF THORACIC ANEURYSM, AND OF OTHER PARTS. By AUSTIN FLINT, M.D., LL.D., Late Professor of Medicine and of Clinical Medicine

in the Bellevue Hospital Medical College, etc., New York. Revised by HAVEN EMERSON, A.M., M.D., Associate in Physiology and in Medicine, College of Physicians and Surgeons, Columbia University, New York. 12mo, 361 pages, illustrated. Cloth, \$2.00, net. Lea & Febiger, Philadelphia and New York, 1912.

AN INTRODUCTION TO THE STUDY OF INFECTION AND IMMUNITY. INCLUDING SERUM THERAPY, VACCINE THERAPY, CHEMOTHERAPY AND SERUM DIAGNOSIS. By CHARLES E. SIMON, M.D., Professor of Clinical Pathology and Experimental Medicine, College of Physicians and Surgeons, Baltimore. Octavo, 301 pages; illustrated. Cloth, \$3.25, net. Lea & Febiger, Publishers, Philadelphia and New York, 1912.

THORNTON'S MEDICAL POCKET FORMULARY. New (10th) edition. Containing over 2,000 prescriptions, with indications for their use. In one leather-bound volume. Price, \$1.50, net. LEA & FEBRIGER, Publishers, Philadelphia and New York, 1912.

HEALTH AND HAPPINESS. A Message to Girls from ELIZA M. MOSHER, M.D. Member American Medical Association; Lecturer on Special Anatomy, Physiology and Hygiene for Women, Chautauqua School of Physical Education; Formerly Resident Physician to Massachusetts State Reformatory Prison for Women; Professor of Physiology and Resident Physician, Vassar College; Women's Dean and Professor of Hygiene, University of Michigan; Lecturer on Hygiene, Adelphi College, Brooklyn, etc. Illustrated by Helen Mulheron. Funk & Wagnalls Company. New York and London. 1912. Price, \$1.00 net.

NEW ASPECTS OF DIABETES. Pathology and Treatment. By Prof. DR. CARL VON NOORDEN, Professor of the First Medical Clinic, Vienna. Lectures delivered at the New York Post-Graduate Medical School, New York. New York. E. B. Treat & Company. 1912.

PATOLOGIA E CLINICA DEL SISTEMA NERVOSO. Lezioni del Prof. CAMILLO NEGRO. Direttore dell' Istituto de Neuropatologia della R. Universita de Torino Medico Primario all'Ospedale Cottolengo. Torino S. Lattes & C., Librai-Editori. 1912.

A STUDENT'S MANUAL OF SURGICAL DIAGNOSIS. By GEORGE EMERSON BREWER, M.D. Professor of Clinical Surgery, College of Physicians and Surgeons, Columbia University; Attending Surgeon to the Roosevelt Hospital, New York. New York and London. D. Appleton and Company. 1912.

DISEASES OF CHILDREN. A Practical Treatise on Diagnosis and Treatment for the Use of Students and Practitioners of Medicine. By BENJAMIN KNOX RACHFORD. Professor of Diseases of Children, Ohio-Miami Medical College, Department of Medicine of the University of Cincinnati; Pediatrician to the Cincinnati Hospital, Good Samaritan Hospital and Jewish Hospital; ex-president of the American Pediatric Society and member of the Association of American Physicians. New York and London. D. Appleton and Company. 1912.

GOVERNEUR HOSPITAL, New York. Tuberculosis Clinic. Report of the Clinic from its Establishment, October 30, 1903, to October 31, 1910. With descriptive and statistical review of the work in all departments.

MANUAL OF MEDICINE. By A. S. WOODWARK, M.D., M.R.C.P., Junior Curator of St. Bartholomew's Hospital Museum; Physician to the Royal Waterloo Hospital and The Miller General Hospital for South-East London; Late Casualty Physician, St. Bartholomew's Hospital, and Senior Resident Medical Officer, Royal Free Hospital. Edinburgh, Glasgow, and London. Henry Frowde and Hodder & Stoughton. 1912.

SERUM DIAGNOSIS OF SYPHILIS AND LUTIN REACTION, Together with the Butyric Acid Test for Syphilis. By HIDEYO NOGUCHI, M.D., M.Sc., Associate Member of the Rockefeller Institute for Medical Research, New York. 23 illustrations, of which 17 are in color. Third edition. Philadelphia and London. J. B. Lippincott Company. Price \$3.00.

BACTERIA. Dr. MAX SCHOTTELIUS. With 10 colored plates and 33 illustrations in the text. Second edition. Translated by Staff Surgeon Herbert Geoghegan, R. N. London. Henry Frowde, Hodder & Stoughton. Oxford University Press, Warwick Square, E. C. 1912. Price \$3.50.

BOOK REVIEWS.

PSYCHOTHERAPY, including the History of the Use of Mental Influence, Directly and Indirectly, in Healing and in the Principles for the Application of Energies Derived from the Mind to the Treatment of Disease. By James J. Walsh, M.D., Dean and Professor of Nervous Diseases and of the History of Medicine at Fordham University School of Medicine, and of Physiological Psychology at the Cathedral College, New York. 740 pages, illustrated. Cloth, \$6.00 net. D. Appleton & Company, New York, London.

This book is based upon the author's lectures before the students at the Fordham University School of Medicine. It presents a great deal of useful information. Many of its discussions are illuminating. For the well informed it presents many interesting references. For the less cultured student it cannot be said to be of value.

It contains many allusions to classic literature, and omits many allusions to modern literature. A considerable portion of the work is devoted to psychotherapy; a larger portion discusses other more or less remotely allied subjects. It is dedicated to the Jesuits "to whom the author owes a happy introduction to the intellectual life and constantly renewed inspiration in his work."

As lectures to unsophisticated students in a sectarian institution the chapters of this book may not have been out of place—it was what the students were sent there for; but as a text-book, to go out of the cloistered atmosphere into the world of science and culture, the author has counted too much upon the credulity of his readers.

It is scarcely fair to hold up to scientific analysis Perkins' tractors and omit the wrist-bone of St. Ann. It is to be regretted that the author does not refer to the influences which have kept alive the faith of the ignorant in amulets, charms, and talismans, while discussing these things. Surely his wide reading and observation must have thrown light upon the subject. It is noteworthy that of them he says: "In all of these effects there is no manifestation of any physical or marvelous supernormal power, but simply and solely of the influence of the mind on the body." Of the pious ecclesiastic humbugs, on the other hand, the author speaks in terms not only of approval but reverence. The schemes for deceiving the ignorant and credulous with holy relics—from Montreal to Rome and from Rome to Jerusalem—around the western world—the scientific mind should recognize as not so very different from those forms of quackery and imposture which are not sanctioned by rite of clergy.

Under the head of miracles the author expresses his belief that their possibility must be admitted "unless one is ready to reject Christianity entirely, or to declare it absolutely impossible that the God who made the universe should have any personal care for it, or above all, any interest in particular individuals in it." The author further thus puts himself on record: "The attitude of utter negation and incredulity often assumed at the present day is only a reflection of a certain ignorance of philosophy, and too great dependence on superficial knowledge of physical science, so charac-

teristic of narrowly trained minds. After a visit to Lourdes and careful study of 'La Clinique de Lourdes,' I am convinced that miracles happen there. There is more than natural power manifest." Is it then true that broadness of training makes for acceptance of this sort of thing? Are the patients who seek the so-called "holy shrines" for relief of their ailments the learned in philosophy? Are they those who have more than a superficial knowledge of physical science? Or is the author indulging in a variety of rhetoric which may win promotion in certain quarters but which he would not be generous enough to apply to the enterprises of Mrs. Eddy, Mr. Dowie, or Father John?

It is incredible that the author is not aware that in those Christian countries where there is the least enlightenment the belief in miracles is the strongest and is the greatest source of pelf and power to the alleged workers of miracles. Spain, Russia, Ireland are to the point. As enlightenment has advanced, the holy icons have fallen away.

If one looks for the inevitable spirit of intolerance which is bound to show itself among such ideas as these, and which when put in action is precisely the thing that is capable of the cruelties which characterized the Holy Inquisition, it is found displayed in a paper of the author's, reprinted in this book, entitled "Responsibility and Punishment." This article breathes back to us through the ages the atmosphere of medievalism. Here is an example: "It has become very clear now that in recent years we have come to take entirely too lenient a view in these matters, and that many criminals who deserved to be punished, both because in this way they would be prevented from future crime and others deterred by the knowledge of their punishment, have been allowed to escape justice. The tendency is toward a too great mercifulness, which spoils the character of the nation, just as leniency to the developing child spoils individual character." We would commend to the author a consideration of the scientific view of criminology and the enlightened modern conception of the treatment of those unfortunates, against whom society has so inhumanly sinned, and with reference to whom our courts and penal systems still are not yet in advance of the ideas expressed in this book. Or if the author is not willing to come all of the way out of medievalism, the perusal of Robert G. Ingersoll's masterly essay on "Crimes against Criminals," written more than a quarter of a century ago, would greatly illuminate his conception of the subject and, perhaps, soften his heart with the sweet tincture of mercy.

The book closes with an appendix of two chapters, closely related but the relationship apparently not grasped by the author: one on "Illusions" and the other on "Religion and Psychotherapy." The first of these chapters is scientific and such as belongs properly in a book on psychotherapy; the last chapter may benevolently be designated as a combination of religious cant and flagrant sophistry—omitting the use of shorter and more appropriate terms which might seem less delicate.

The book closes with this sentence: "We are here on trial for another world is the thought that in the past strengthened men to bear all manner of ills, if not with equanimity, at least without exaggerated reaction. It has still the power to do so for all those who accept it simply and sincerely." The author evidently is assuming that his readers are not aware of the horrible effects exercised by this dogma of other-worldliness during that unhappy period in which it prevailed, otherwise it is inconceivable that it would have been written in an ostensibly scientific book.

On the whole there is strong evidence to support the suspicion that the author is a great wag, and that this book is not to be taken seriously; but like that most droll and whimsical publication, "The Thirteenth of the Greatest of Centuries," this too has been written in a spirit of waggishness, as an emollient to the acerbities of academic labors.

J. P. WARBASSE.

CONSTIPATION AND ALLIED INTESTINAL DISORDERS. By ARTHUR F. HERTZ, M.A., M.D., OXON., M.R.C.P. Assistant Physician Electrical Department and demonstrator Morbid Anatomy, Guy's Hospital, formerly Lecturer on Pharmacology at Oxford University and demonstrator of Pharmacology and Physiology at Guy's Hospital; formerly Radcliffe Travelling Fellow of Oxford University. London. Henry Frowde, Hodder & Stoughton. Oxford University Press. Warwick Square, E. C., 1909. Price, \$4.00.

This book covers the physiology of intestinal movements, the causes of, the symptoms and treatment of constipation and allied disorders. In the chapter on physiology, he shows well by means of the bismuth test meal, skiagrams of the intestinal movements. Accompanying the text is a diagram explaining the stimuli and nervous control. Later on, he shows X-ray pictures of how various nervous influences effect the bowel contents; also how different food stuffs travel at varying rate along the intestinal tract. Undigested cellulose and starch move most rapidly. Peristaltic action is more rapid in herbivorous than carnivorous animals: more vigorous in vegetarians than in people who have a mixed diet. Shows likewise how different foodstuffs have a selective action along the intestinal tract.

The chapter on causes of constipation is well worth reading, for it is fairly complete, concise and gives many valuable points to the practitioner of medicine on this most common and often unyielding complaint of our patients. Skiagrams being of considerable worth as an aid in the differential diagnosis of these obstinate cases.

The last quarter of the book is devoted to treatment. The many and varied procedures from prophylaxis to operative are considered. Under the dietetic, he includes a valuable table taken from Robert Hutchinson's book—Food and the Principles of Dietetics, showing the percentages of cellulose in different foods. The manner in which he considers the whole subject of treatment, classifying as well as can be, those patients that will do best on any one of the special form of treatment, is commendable.

R. C.

SALVARSAN IN SYPHILIS AND ALLIED DISEASES. By J. E. R. McDONAGH, F.R.C.S.; Surgeon to Out-Patients, London Lock Hospitals. Pp. 152. Henry Frowde, Hoddard & Stoughton. New York and London. Oxford University Press, 1912.

In this supplementary volume to Power and Murphy's system of Syphilis, the entire subject of Salvarsan in Syphilis and Allied Diseases is discussed in 152 pages. The book is well arranged and the subject is taken up in a logical manner. The by-effects of Salvarsan are only touched upon as the author evidently believes that they are due mostly to errors in technique and the use of solutions made from water not freshly distilled. The only neuro recurrences discussed at all are those of the optic and auditory nerves and these the author believes to be syphilitic recurrences and not due to Salvarsan.

When intramuscular injections are used McDonagh advocates Ioha, a suspension of Salvarsan in Iodipin, as the preparation of choice. Most Syphilographers agree that the suspensions in oil are poorly absorbed and uncertain in their action. The alkaline solution though more painful is thought to be the most efficient preparation when given intramuscularly. In the method described by McDonagh for preparing the alkaline solution for intramuscular injection, there is a total quantity of 26C. C. of solution for .6 grms. This is too large a quantity to be injected into the buttocks. The solution can be prepared properly with a total quantity of fluid not exceeding 12 C. C.

In treating primary cases of Lues the author gives Salvarsan intravenously, and if he obtains a negative wassermann reaction on the case on the first, fifth, and fourteenth day following the injection he advises no further treatment. This would appear to be rather a

risky method to follow as a number of those cases will quite likely give a positive wassermann reaction at some future time.

In the treatment of the secondary stage of syphilis McDonagh advocates an intravenous injection of Salvarsan once a week for three weeks, then another in two weeks and this to be followed by one every three weeks until a negative wassermann reaction is obtained and finally an intramuscular injection of Ioha is given. Unfortunately most patients will not submit to such intensive treatment nor does it seem to be necessary.

While every one will admit that Salvarsan is a valuable addition to the therapeutics of Syphilis, it has not absolutely displaced mercury in the treatment of this disease. McDonagh, it seems is a little too enthusiastic in his praises of this valuable remedy and has failed to consider the failures and accidents of this new remedy as well as its benefits.

A. P.

A TEXT-BOOK OF PATHOLOGY. For Students of Medicine. By J. GEORGE ADAMI, M.A., M.D., LL.D., F.R.S., Prof. Pathology McGill University, Montreal, and John McCrae, M.D., M.R.C.P., (London), Lecturer Pathology and Clinical Medicine McGill University, formerly Prof. Pathology University of Vermont. In one octavo volume of 759 pages, with 304 engravings and 11 colored plates. Cloth, \$5.00, net. Lea & Febiger, Philadelphia and New York, 1912.

Just such a text book on Pathology as is this has long been a crying want in English medical literature. Works on Pathology have not been wanting; indeed, there has been a multiplicity of them; but as a rule they have been mere compilations, and but little was added to one's library as each succeeding volume was placed on the shelves. It is refreshing, therefore, to find in the present volume few of the ear-marks of the common style of the past few years. Here the reader looks in vain for the old familiar and unconvincing illustrations; nor is he led through a maze of exploded theories. The material is thoroughly up-to-date and is a comprehensive and lucid presentation of the present knowledge of this rapidly growing subject. The scope of the book is both general and special and exactly meets the requirements of the student of pathology.

The English Pathologies have always been inferior to the German and as a result the expert pathologist has been forced to be familiar with the latter language, in order to keep in touch with the subject. This work is equal to any in the German, and it is fair to say that it now has the same position among English text books on Pathology as has Kaufmann among those in German.

The writers had no need to apologize for presenting this volume so closely after the more extensive two volume work of Adami & Nichols. Each has its field and in no way do they conflict.

F. M. J.

MANUAL OF SURGERY. By ALEXIS THOMSON, F.R.C.S., Ed. Prof. Surgery, University Edinburgh; Surg. Edinburgh Royal Infirmary, and Alexander Miles, F.R.C.S., Ed. Surg. Edinburgh Royal Infirmary. Volume II, Fourth Edition, revised and enlarged, with 274 illustrations. Edinburgh, Glasgow and London. Henry Frowde and Hodder & Stoughton. 1912.

The second volume of this work, revised and enlarged is devoted to regional surgery. It contains 891 pages. The volume is presented in a handy form. The type is well set and is a readable size. The paper is well selected. The usual anatomical headings have been observed and represent thirty-seven chapters. In general terms, the authors have adhered to the usual classification of surgical lesions, congenital malformations, injuries, inflammations, tumors, and mechanical conditions (acquired displacements and abnormal mobility), although this order has not been invariably followed in each case. As a result, some omissions are to be found. A very excellent little presentation of the surgical anatomy is set forth at the commence-

ment of each chapter. Physiology of the subject is included as well. In certain instances special methods of examination are to be found as on cystoscopy, bronchoscopy, etc. Embryo-logic considerations are included under congenital malformations. Nineteen chapters are devoted to the head and neck. Chapters xiv, xv, xix upon the ear, nose and naso-pharynx, larynx, trachea and bronchi have again been revised by Dr. Logan Turner. These chapters are concise and the subjects are well treated. In chapter xx, upon the chest a short description of differential pressure in thoracic surgery is added. In chapter xxi, devoted to the breast, a section is devoted to inoperable cancer. The authors mention the beneficial effect of salpingo-oophorectomy upon these cases as advocated by Beatson of Glasgow. The idea underlying this procedure is that the removal of these organs interferes with the nutrition of the tissues in such a way as to arrest the progress of the new growth by increasing the fibrous stroma of the tumor at the expense of cellular elements. Hugh Lett, in a series of 100 cases thus treated reports that nearly one-half of the cases under fifty years of age derived marked benefit in the form of relief from pain, improvement in general health, diminution or even temporary disappearance of the growth and healing of ulcers. He states that contra indications are metastases in other organs, local recurrence occurring soon after operation and all very rapidly growing tumors. It would seem then to have a very narrow field of usefulness. No mention is made of the autolysed fetal and red blood cells or Fitcher's serum.

Chapters xxii to xxx are devoted to abdominal surgery. Peritonitis is classified as non-infective (chemical and mechanical) infective (due to bacterial invasion), local and diffuse. It is gratifying to see the "general" passing into disuse. Postoperative peritonitis and tuberculous peritonitis are discussed in short paragraphs. Laparotomy is advocated in case of the latter if improvement does not take place as a result of medical and hygienic treatment in three months. In selected cases of the ascitic form it would seem to the reviewer not wise to postpone operation, but to resort to surgery as soon as the diagnosis is made. Chapter xxiv, devoted to the Vermiform Appendix is a very excellent exposition of the subject. The authors lay stress upon Murphy's order of the appearance of the signs and symptoms. This is not applicable, however, to the retrocecal and retrocolic forms. The authors state: "The only safe rule to follow in practice is to operate upon every case of acute appendicitis at the earliest possible moment." This appears to be the only means of diminishing the mortality. It doubtless involves that in a certain number of cases, the operation was not necessary to save the patients' life. Expectant treatment is outlined and consists of the Fowler-Murphy-Ochsner methods. The writers insist upon transporting cases of acute appendicitis in the Fowler position. It is noted that no mention is made of the plan adopted by certain English surgeons of opening appendicular abscess through the bowel. This method is to be condemned.

An excellent chapter is devoted to hernia, Chapter xxvi upon the stomach and duodenum follows this. In presenting the clinical features of carcinoma ventriculi to the student, it is well to emphasize the pathologic relationship between ulcer and cancer, and follow the sequence of symptoms from the precancerous lesion to the fully developed case. The latter is the usual presentation of the subject. This consideration of precancerous lesions is of the utmost importance and should continually occupy the most profound minds of the profession. If the subject is presented in this way, the high mortality of cancer of the stomach can be lowered. In the treatment of post operative intestinal obstruction, the authors fail to mention the use of peristaltic hormone.

Chapter xxviii is devoted to the affections of the liver, gall bladder and ducts. In regard to the forma-

tion of gall stones, the authors present the view of Aschoff and Barmeister that these may form without infection or inflammation of the gall bladder. The essential factor according to them is the stagnation of bile. The older explanation of Naunyn, presented in 1892 is the one which is most generally accepted, namely that stones occur as the result of bacterial invasion. The reviewer feels that he must take issue with the authors in their explanation of the cause of pain in biliary colic. They claim spasm results from irritation of the mucus membrane of the gall bladder. This is not in accord with the explanation of Warbasse and others that it is due to involvement of the peritoneum. That startling statement, the heresy inculcated by the dead house and based entirely upon post mortem pathology that gall stones are frequently found in the gall bladder at autopsy without having given rise to symptoms during life appears in this book and was read with much surprise and regret. No mention whatever is made of gall bladder dyspepsia. The prodromal symptoms of cholithiasis were first described as early as 1884 by Krause. Almost every authority, English and German had accepted the statement regarding the innocence of gall stones from generation to generation. It would seem that even the more recent forceful writings of Moynihan and Mayo have failed to impress the authors of this manual. In operating for the relief of chronic pancreatitis, the authors offer cholecyst-enterotomy as the operation of choice to secure drainage.

The chapter by Dr. F. W. Haultain, upon abdominal and pelvic conditions peculiar to women, although a very excellent one were better left out of this small volume. Students consult special works for their knowledge of gynecology and in American colleges, the teaching of it is usually a separate and distinct branch of surgery. Scant space is allotted to the diagnosis of impending rupture in tubal pregnancy. The symptoms are worthy of much wider recognition than is accorded them.

Chapter xxxi is devoted to the rectum and anus. An excellent operation, devised for the treatment of fistula-in-ano by excision of the tract and its ramifications receives no mention. Under the surgical treatment of pruritis ani, the authors describe an operation which has given very gratifying results to the reviewer, namely division of the sensory terminations of the nerves in this region. A semi-circular incision is made on each side of the anus and a subcutaneous flap undermined to the anus.

An excellent presentation of genito-urinary conditions met with in daily practice is described. The authors advocate autogenous vaccines in the treatment of colon infections of the urinary tract. No mention is made of the otherwise inoperable treatment of tumors of the bladder by high-frequency currents (Oudin), popularised by Edwin Beer.

The final chapter deals with the extremities, mainly with orthopedic lesions. What has been said of affections peculiar to women applies to this portion of the work as well. The space might well be used for a consideration of fractures.

The index is well arranged and affords easy access to the text. Speaking in general terms the work is an excellent one. The illustrations number 274 and are very well chosen.

It is with much satisfaction that the reviewer encounters the names of the master minds in American Surgery. Thus the Abbe treatment of esophageal stricture is mentioned, Mayo's work on goitre, Rodman's and Halsted's upon the breast. Fitz (spelled Fritz by the way) Fowler, Murphy and McBurney receive credit for their life endeavors and researches upon appendicitis and peritonitis. Finney, W. J. Mayo, Rodman, etc., are mentioned in connection with their work on the stomach and duodenum.

R. H. F.

MEDICAL GYNECOLOGY. By SAMUEL WYLLIS BANDLER, M.D., Fellow American Association Obstetricians and Gynecologists; Ad. Prof. Diseases of Women, New York Post-Graduate Hospital, etc. Second Revised Edition. With original illustrations. Philadelphia and London. W. B. Saunders Company. 1909. Price: Cloth, \$5.00.

To help to strike a balance between the puttering and procrastination of much of the office treatment of pelvic disorders and the offhand extirpations and peritoneal invasions of the man behind the knife is to render a genuine and much needed service. Bandler has rendered such service, in his book, with its simplicity and clarity of statement, good order and perspective, and excellent English. The need is emphasized on the part of every medical man, gynecologist, general surgeon or family practitioner to look away from the pelvis as the foundation of diagnosis and treatment—not, as one may say, to let the dome of the fundus loom so high as to obscure the prospect behind it. Both diagnosis and treatment are well handled. "The aim has been to make each section complete in itself," which causes the book to be somewhat longer than if there had been fuller use of cross references. In only a few points is manifest a leaning toward German and away from American practice.

In the pelvic examination the author advises the employment of a table that will permit of a Trendelenburg incline of the trunk. This invaluable aid to the emptying of the bowels out of the pelvis in the bimanual examination is almost unused in the great German polyclinics and too infrequently here. The cystoscope is included as a regular part of the pelvic armament. Gauze is recommended as tampon material instead of wool or cotton, and as a lubricant, to replace the greases or the expensive advertised articles, the cheaply prepared tube of boiled Irish moss. His free use of the cylindrical speculum runs counter to American practice, nor are Hegar dilators as popular with us as branching models. Catheterization as part of the ordinary examination seems to us to represent unnecessary risk. As a measure of completeness in examination, the bimanual, with the patient in the later-prone posture, is not accented; nor is attention drawn to the comfort afforded by the same posture in using the bivalve speculum for work on the cervix in a gaping vagina, whether with the aid of a nurse or not; while he omits to warn that the vaginal tamponade should surely be placed in the knee chest posture. With regard to douching mention might be made of the vaginal tubes bearing vulvar shields that permit of ballooning the vagina with the patient upright, and the long glass pipette with bulb is simpler for applications than the standard rubber syringe that cannot be boiled.

The section on curettement is good. Atmocausis is endorsed, but its technic is difficult, and the German X-ray treatment is now controlling the menorrhagias of chronic metritis and ovarian over-activity. The pessary is given its meed of credit. Abdominal massage is well covered and pelvic massage briefly approved. If the ergot cramp lets go in an hour, doses at this interval are called for.

As an example of the author's wise consideration of general states, his treatment of the inter-relations of amenorrhea and obesity may be noted, and as to his healthy skepticism, the discrediting of actual blockade dysmenorrhea. The subject of Associated Neuroses is treated fully and well. His inclination is toward neurasthenia and away from hysteria. The thyroid disturbances also receive due consideration. Ovarian extract has afforded him good results in the surgical menopause. He balances up the male side of the sterility problem well. Constipation is adequately studied and a protest made against reliance on the drug habit and the neglect of the investigation of the cause itself and of the education of the patient. As for the matter of crediting nearly all chronic cervical inflammations to gonorrhoea, most men on this side of the water will

probably take issue with the author. They may also disagree as to the wisdom of his very active treatment of gonorrhoea in children, and of surgical interference in adults except where pus collections are convenient to drain. Bandler thinks the microscope has done much to hamper diagnosis in sub-acute and old cases, as "several slides and several hours of study are necessary to the finding of gonococci," particularly since "gonococci disappear for weeks." In attacking endotrachelitis, he emphasizes the need of limiting treatment to the vaginal aspects of healing erosions, as the curet, for instance, may easily carry gonococci higher up the canal. Ectropion calls for amputation.

Bandler takes his stand against stress being laid on the uncomplicated displacements of retroversion, and objects to operation for those readily reposit and those which, after being well held by pessaries, show no improvement in symptoms. He quotes with approval Schroeder's figures of 400 women exhibiting 25 per cent of retroversions, two-thirds of them without symptoms. And it may be noted that three of the strongest of the German gynecologists of today discredit uncomplicated retroversion as productive of disturbance.

The book shows itself to be an excellent special plea, by an operator, for careful attention to treatment other than operative, and ably combines conservatism with fearlessness.
R. L. D.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. With especial reference to the application of remedial measures to disease and their employment upon a rational basis. By HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Fourteenth edition, thoroughly revised. Octavo, 984 pages. Illustrated with 131 engravings, and 8 plates. Lea & Febiger, Philadelphia and New York, 1912.

There are two reasons why "Practical Therapeutics" does not require extensive comment. The first is, because it is written by Professor Hare; the second, that it is the fourteenth edition of this standard work, which has been before the medical public for twenty-two years. For the benefit of a newer generation that may possibly not have personal knowledge of the book, it is only necessary to mention briefly the salient features which it contains.

The introductory chapter of fifty odd pages summarizes general therapeutic considerations. It would be well if every physician would transcribe and frequently consult the four aphorisms with which this chapter opens.

Part two deals with drugs and is arranged alphabetically, a method that commends itself over the classification according to physiological effect that is employed in many text-books. It goes without saying that the list of drugs has been amplified to include all that are recognized in the latest edition of the Pharmacopœa.

Part three deals with remedial measures other than drugs and with food for the sick. This chapter includes an article on antitoxines, with more particular reference to the antitoxic sera for diphtheria, gonorrhœa, meningitis, tetanus and streptococcus infections. Applications of heat and cold are dealt with at length. Inhalations receive quite extensive treatment. Vaccine therapy is noticed. This chapter also contains a number of formulæ for the preparation of invalid foods of various kinds.

Section four takes up the therapeutics of disease in concise and yet comprehensive articles, also arranged alphabetically. Sufficient cross references are included to avoid unnecessary repetition.

The volume closes with a dose table and two comprehensive indices covering both the section on drugs and that on diseases. There can be no question of the practical value to student and practitioner alike of this last edition of Professor Hare's book.
H. G. W.

SUGGESTION AND PSYCHOTHERAPY. By George W. Jacoby, M.D., Member N. Y. Academy Medicine, Am. Med. Asso., Am. Neurol. Asso., Hospital for Nervous Diseases. With illustrations. New York. Charles Scribner's Sons. 1912. Price, \$1.50 net.

The public has been much confused upon the subject of psychotherapy; and, indeed, it cannot be said that the medical profession is yet altogether enlightened as to its possibilities. This is a field which medicine neglected, only to find it taken hold of by the quack and superstitious zealot who, between the two of them, have made a travesty of mental healing.

The author of this book has endeavored to clarify the subject on a scientific basis. There is little need for his *naïve* suggestion that the reader may reread any chapter which at first may seem obscure.

He discusses the organs of mental activity from a physiologic and pathologic standpoints. Suggestion as a psychic force is discussed in reference to its history and development. Psychotherapy is considered with reference to its origin, dangers, limitations and possibilities. The methods of mental therapeutics are discussed. The "Emmanuel Movement," "Christian Science," and other similar vagaries are described in an analytic manner.

Contrast with Dr. Walsh's book on Psychotherapy the following from Dr. Jacoby: "Today we need no longer fold our hands in resignation and inactivity. Today we know that there is no intervention of supernatural power in the laws of nature, and whether diseases will be come our undoing or whether we will be able to deflect their course or to cure them, depends essentially upon our comprehension of the physical and chemical forces which nature holds in store."

This book is well worth reading, and may be regarded as a scientific exposition of a subject too much discussed without the light of science.

J. P. W.

MANUAL OF PHYSIOLOGY for Students and Practitioners. By H. Willoughby Lyle, M.D., B.S., F.R.C.S.; formerly Lecturer on and Senior Demonstrator of Physiology in King's College, London. 747 pages, illustrated. Oxford University Press, London.

The author states in his preface that he has written this book to furnish the student a manual of convenient size and at the same time sufficiently comprehensive to place before him the chief facts of physiology as concisely as possible. By omitting the subjects of histology and embryology and all references to the literature of the subject and the description of apparatus and the discussion of the methods of arriving at the conclusions given, the author has succeeded fairly in condensing the subject into 734 pages of text. The subjects are briefly and concisely stated in accordance with the accepted ideas of today, well written in a readable style and well edited, and contains a good index. It is a handy volume and ought to be a good book with which to follow a course of lectures or to review the subject to prepare for examination. It is doubtful if teachers in our best colleges will be willing to recommend it as the only text book. In some of the chapters, as, for example, that on Reproduction, the process of condensation has been carried too far for perfect clearness. In other chapters, as, for example, that on Metabolism, leaves little to be desired.

E. H. B.

THE COLLECTED WORKS OF CHRISTIAN FENGER, M.D., 1840-1902. Vols. I and II. Edited by Ludvig Hektoen, M.D., Professor of Pathology at Rush Medical College. Philadelphia and London. W. B. Saunders Company. 1912. Pet set: Cloth, \$15.00 net; half morocco, \$18.00 net.

Shortly after the death of Dr. Fenger, the Chicago Medical Society appointed a committee to formulate plans for perpetuating the memory and work of this great teacher. Out of this committee grew the Fenger Memorial Association, which collected a fund the in-

come of which was to be used to promote medical research. As a result of requests from Dr. Fenger's former pupils and from surgeons in different parts of the country the Association has caused to be published these two volumes containing nearly all of Dr. Fenger's published writings.

The work opens with an autobiography which was written in Danish in the year of his death at San Diego, California, in response to the requirement that every one who receives the order of Knight of Dannebrog shall furnish a sketch of his life. This biography is straightforward, and describes in simple language the span of the life of an earnest, honest man. Of adversity he had enough to try his quality. Born in rural Denmark, one of twelve children, his love of the natural sciences took him into medicine. At twenty-three he began his medical studies, teaching school at the same time to help pay his expenses.

We find him as assistant physician in the Danish army, interne in the Royal Frederik Hospital, surgeon in the international ambulance in the Franco-Prussian War, student at Vienna, practitioner at Alexandria and Cairo, practitioner in Chicago, and finally Professor of Surgery in Rush Medical College and Surgeon to the Presbyterian and Lutheran Hospitals. His entrance into scientific work in Chicago was in giving lectures on pathological anatomy at Cook County Hospital. He says: "In the spring of 1878 I secured, by means of borrowed money, a place as physician to Cook County Hospital, and here I commenced to give lectures and demonstrations in pathologic anatomy, a science which was unknown to the physicians there."

During this eventful career Fenger wrote three or four surgical articles a year. These constitute the work. They make two good-sized volumes—well edited and illustrated—a monument to Fenger and an inspiration to workers in this fertile field. J. P. W.

THE SURGICAL CLINICS OF JOHN B. MURPHY, M.D., AT MERCY HOSPITAL. CHICAGO—APRIL, 1912, AND JUNE, 1912. Published Bi-Monthly by W. B. Saunders's Company, Philadelphia and London.

The publishers are to be congratulated in presenting to the profession these series of clinics, which represent the rich and ripe experience of a great clinician and a master of surgical didactics. Next to seeing Dr. Murphy at his work and feeling the inspiration of his remarkable personality is the perusal of these clinics, presenting as they do in such a vivid manner the forcible, lucid and dogmatic style of the author, which at once charms and convinces the reader.

It is evident that the material in these volumes are the stenographic reports of the cases just as they are handled by Dr. Murphy in his clinic at Mercy Hospital. This remarkable series of case histories with Dr. Murphy's comments is not only pregnant with scientific interest, but further—the author charms with his art—the art of elucidation, the awakening in the mind of another clearer vision and firmer grasp. W. F. C.

DEATHS

DAVID H. AGAN, M.D., New York City, died November 6, 1912.

EDWARD CURTIS, M.D., New York City, died November 28, 1912.

MARKAR G. DADIRRIAN, M.D., New York City, died November 24, 1912.

WILLIAM QUINCY HUGGINS, M.D., Sanborn, died October 21, 1912.

WILLIAM FREDERICK REX, M.D., Brooklyn, died November 1, 1912.

C. A. VON RAMDOHR, M.D., New York City, died November 17, 1912.

EDWIN F. WARD, M.D., New York City, died November 23, 1912.

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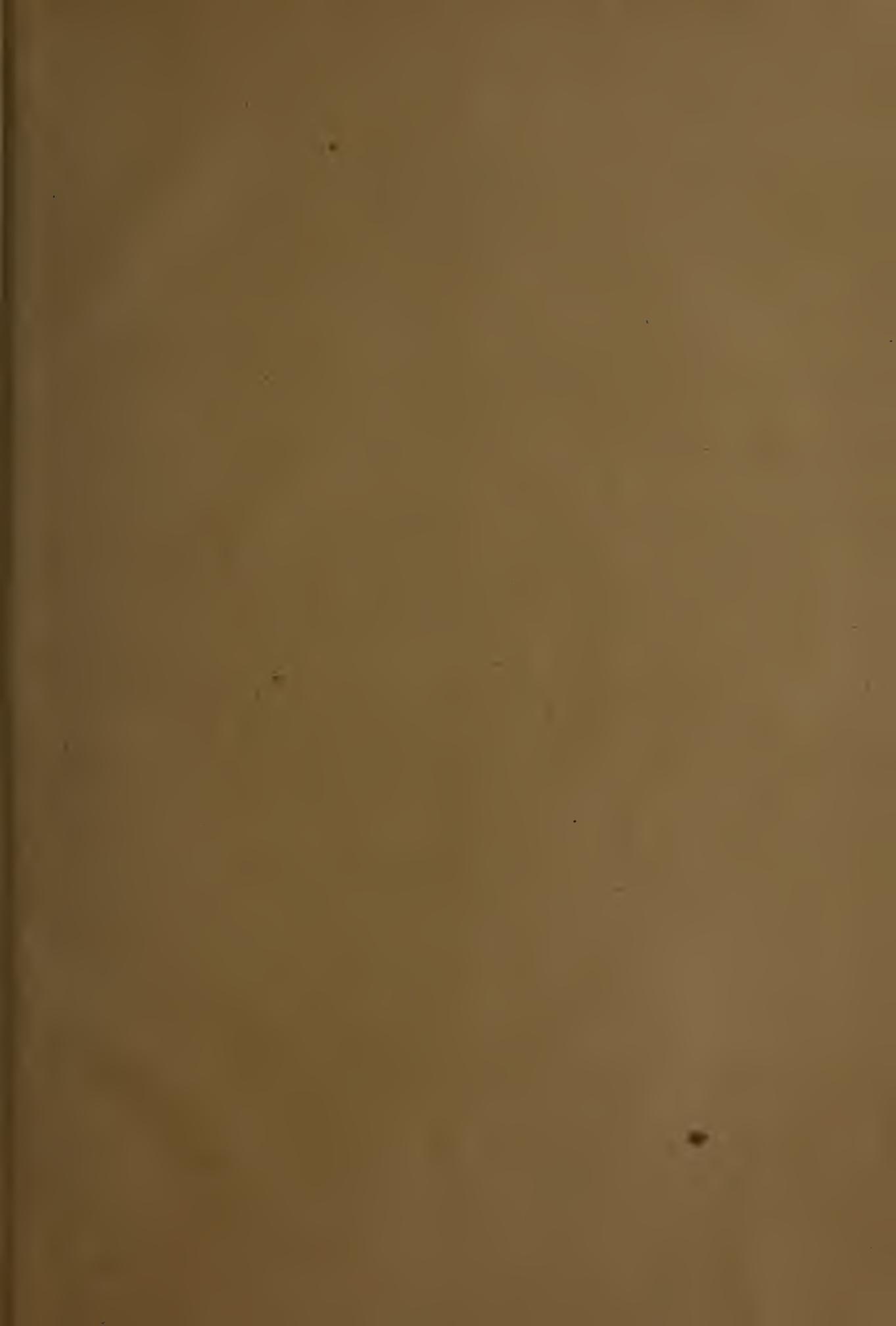
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